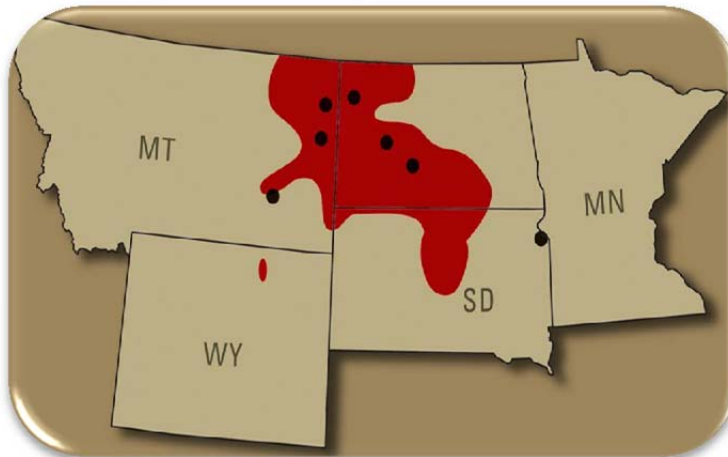




Integrated Resource Plan



2013



Submitted to the
North Dakota Public Service Commission
July 1, 2013

Volume II: Attachment A

Montana-Dakota Utilities Co.
2013 Integrated Resource Plan

Submitted to the North Dakota Public Service Commission

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Volume II
Attachment A



**MONTANA-DAKOTA
UTILITIES CO.**

A Division of MDU Resources Group, Inc.

Attachment A

MONTANA-DAKOTA UTILITIES CO. ELECTRIC LOAD FORECAST Integrated System (MT, ND, and SD) 2013–2032

Prepared by
Montana-Dakota Utilities Co.
Electric System Operations & Planning Department

December 31, 2012

ELECTRIC LOAD FORECAST

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Executive Summary

This report presents the 2013-2032 forecasts of Montana-Dakota Utilities Co.'s (Montana-Dakota) electric energy requirements and peak demands for the Integrated System of Montana, North Dakota, and South Dakota. The forecasts are prepared by the Electric System Operations & Planning Department. An econometric methodology of forecasting is generally used as the starting point for Montana-Dakota's load forecasts.

INTEGRATED SYSTEM

Total annual energy for the Integrated System is projected to grow at an average rate of 3.2% per year for the next five years and at an average rate of 2.0% per year through 2032. Integrated System summer peak demand is projected to grow at an average rate of 2.4% per year for the next five years and an average rate of 1.6% per year through 2032 prior to any reductions due to demand response programs. Integrated System winter peak demand is projected to grow at an average rate of 2.7% per year for the next five years and an average rate of 1.7% per year through 2032. Much of the higher rate of growth in the first five forecasted years can be attributed to the growth in load due to Bakken Oil Field activity and the Keystone XL Pipeline load that is projected to begin to ramp up in 2014.

As described in Montana-Dakota's 2011 Integrated Resource Plans filed with the North Dakota and Montana Public Service Commissions, Montana-Dakota has established a Demand-Side Management (DSM) goal of achieving a reduction of 0.18 percent of annual energy sales by 2013 and 0.25 percent for 2014 through 2031 through the use of new and existing energy efficiency programs. Additionally, Montana-Dakota will pursue a demand response portfolio that will include a Residential Air Conditioning Cycling program, a Commercial Demand Response program, and adjustments to the Company's current Interruptible Demand Response program. The effects of the demand-side management (DSM) programs that will be implemented in the Integrated System to achieve these goals are reflected in the sales and demand forecasts.

Econometric Overview

Montana-Dakota uses econometric modeling as the starting point for its forecasts. The econometric models are developed using the statistical software package SAS[®]. In order to capture the extraordinary growth currently being experienced and expected as a result of the Bakken oil field activity, other forecasting methods and analysis also enters into the forecasting process for the Integrated System resulting in a combined analysis approach to the forecast.

An econometric model is a set of equations that expresses electricity use as a function of underlying factors such as income, price of electricity and alternate fuels, and weather.

The strengths of econometric forecasting models include:

- Econometric models explicitly measure the effects of underlying causes of trends and patterns.
- Econometric models provide statistical evaluation of forecast uncertainty.
- Econometric models utilize economic and demographic information that is easily understood.
- Econometric models can be readily re-estimated.

The econometric method combines economics theory and statistical techniques to produce a system of simultaneous equations. The method starts with estimating causal relationships between electric energy consumption (the dependent variable) and factors influencing electricity use (the independent variables). The relationship is estimated by applying regression analysis or other more sophisticated methods to time-series data. Once the relationships are established, inserting forecasts of the independent variables into the equation yields projections of the dependent variable.

A number of demographic and econometric variables were tested for fit in the process of developing the Integrated System forecast. Various combinations of variables were tested for statistical significance when evaluating the data to be used in each equation. The following is a list of variables that were available for both the historical time period being analyzed and the forecasted time period:

- Residential price of electricity
- Small Commercial & Industrial price of electricity
- Large Commercial & Industrial price of electricity
- Residential price of alternate fuel (natural gas)
- Commercial price of alternate fuel (natural gas)
- Total Personal Income
- Heating Degree Days (HDD) for Bismarck, ND and Aberdeen, SD
- Cooling Degree Days (CDD) for Bismarck, ND and Aberdeen, SD
- Number of Households

Employment by Sector
Total Retail Sales
Temperature at the time of peak for Bismarck, ND; Williston, ND; and
Miles City, MT; for the Integrated System forecast

The variables used in each resulting equation are noted in the narrative that follows for each sales sector forecast. The forecast process begins by estimating the full models and then removing variables for which the estimated coefficient either has the wrong sign or is not statistically significantly different from zero (using a p-value of 0.10).

Until this year, forecasts for the Integrated System have always been developed on a total Integrated System basis followed by allocations to the states of Montana, North Dakota, and South Dakota. With the Electric Load Forecast 2013-2032 published this year, for the first time the forecasts were developed for each sales sector on a state by state basis rather than an Integrated System basis.

Data Sources

At the time this analysis was begun for the Integrated System (June 2012), the most recent year for which a complete set of weather and actual monthly sales by sector was available was 2011.

The data used in the development of the forecast that are available in-house include Montana-Dakota's rate projections, historical sales, energy, demand, losses, natural gas and electricity prices, and number of customers or bills.

In addition to the data available in-house, most of the economic and demographic data are obtained from Woods & Poole Economics, Inc. (W&P) of Washington, D.C. by county. The W&P data are apportioned and adjusted to represent the data for the Montana-Dakota service territory. Other data sources include the National Oceanic and Atmospheric Administration (NOAA), U.S. Census Bureau, and others.

The forecast for the Integrated System is developed annually. Likewise, the W&P data by county are available annually from the regional model developed by W&P. W&P revises the regional model from one year to the next to reflect new computational techniques and new sources of regional economic and demographic information. Each year, W&P produces new projections based on an updated historical database and revised assumptions. Therefore, the data provided by W&P captures the economic conditions in place at the time that the W&P forecasts are produced.

While national economic conditions can change quite quickly, data from W&P is provided once per year and therefore may not reflect the most current economic climate. For Montana-Dakota's service territory, this is not always a concern since this area is somewhat isolated from factors affecting the rest of the country; economic trends felt nationally usually take a year or two or more before their impact reaches this area. While the recent economic downturn was felt by the majority of the country in the last five years, Montana-Dakota's service territory was enjoying a robust agricultural sector, intense oil field drilling activity, and increased energy usage resulting from high oil prices. In fact, unemployment in North Dakota has fallen to the lowest level in the nation, 3.2 percent – less than half the national rate of 7.8 percent as of December 2012. Unemployment rates are well below national averages in South Dakota and Montana. Therefore, the forecast for the Integrated System continues to reflect fairly strong growth.

Degree days are used to estimate how hot or cold the climate is and how much energy may be needed to keep buildings cool or warm. Heating degree days, HDDs, are calculated by subtracting the mean daily temperature from 65°F, and summing only positive values over a given period of time, while cooling degree days, CDDs, are calculated by subtracting 65°F from the mean daily temperature, and summing only positive values over a given period of time.

The HDD and CDD numbers used are annual values and the change in magnitude from one year to another is more relevant for representing warmer or cooler than normal weather in the analysis than the actual values. Since the forecasts were developed for each sales sector on a state by state basis this year rather than an Integrated System basis, HDD and CDD for sites in North Dakota, South Dakota, and Montana were considered for representation of degree days in Montana-Dakota's electric service territory in each state.

Bismarck and Mandan, ND account for approximately one-third of Montana-Dakota's Integrated System electric sales annually. Therefore, Bismarck HDD and CDD were used to represent Montana-Dakota's service territory in North Dakota. There are no NOAA National Climatic Data Center (NCDC) stations with complete local climatological data available in Montana that are in Montana-Dakota's electric service territory. It was decided that Bismarck HDD and CDD values would best represent the Montana-Dakota service territory in Montana as well.

There are also no NOAA NCDC stations in South Dakota that are in Montana-Dakota's electric service territory. After reviewing available data, it was decided that Aberdeen, SD HDD and CDD would be used to represent Montana-Dakota's service territory in South Dakota.

Historical personal income per household is calculated to be total personal income divided by the number of households for those counties in which Montana-Dakota provides electric utility service. Historical personal income is

available from the W&P data which come from the U.S. Department of Commerce. Historical households are also from the U.S. Department of Commerce. Forecasted personal income and number of households are projections provided by W&P.

Historical company data used in the development of the forecasts are included in Appendix A for the Integrated System. Appendices A-1 through A-4 list annual sales by customer class for Montana, North Dakota, South Dakota, and the Integrated System for the years 1966-2012, respectively. Appendix A-5 lists the seasonal peaks and load factors of the Integrated System for the years 1960-2012. Appendix A-6 lists demand by state at the time of the system peak for the summer and winter seasons.

Appendix B contains historical and forecasted values for the exogenous variables for the Integrated System.

Forecast Accuracy

In July 2009, Montana-Dakota conducted a study, "Evaluation of Load Forecast Accuracy," to examine the accuracy of its forecast. The study provided a statistical validation of the accuracy of the company's forecasts and also helped to better understand forecast problems and improve forecast accuracy in the future. The evaluation was conducted on three forecasted quantities: annual energy requirements, summer peak demand, and winter peak demand.

Three statistical metrics were used to evaluate the forecasts: Average Percentage Error, Average Absolute Error, and Mean Square Error. These metrics compare actual observations with the predicted values. Actual historical data from 1998-2008 as well as the forecasts produced from 1998-2007 were used in the analysis.

The study found that Montana-Dakota had produced relatively accurate forecasts. For the five-year-ahead forecasts, where the largest error levels occur, the annual energy requirement forecasts are within 7% of the actual, while the summer and winter peak demand forecasts are within 5% and 3% of the actual, respectively. For both the annual energy requirement and the summer peak demand forecasts, Montana-Dakota generally forecasted lower than the actual. The analysis also showed that the winter peak demand forecast is accurate but could likely be improved by developing a separate econometric model for winter peak demand rather than applying a ratio to the forecasted summer peak demand to arrive at forecasted winter peak demand as had previously been done.

As the result of the study, the winter peak demand forecast is now performed with an econometric model independent of the summer peak demand forecast model for the Integrated System.

Integrated System

Overview

From 2006-2011, econometric equations were used to develop long-range (20-year) electric load forecasts for Montana-Dakota's Integrated System, which is comprised of Montana-Dakota's service territories in Montana, North Dakota, and South Dakota. The total Integrated System sales by sector were then allocated to the individual states.

With the forecast developed in 2012, for the first time the forecast was created for each state individually – Montana, North Dakota, and South Dakota – and the forecasts by state were combined to arrive at the Integrated System forecast in total. The previously used methodology of allocating Integrated System sales to the states was becoming more difficult to accomplish while capturing the shifting percentage of sales in each state. This was a result of the higher growth now experienced in North Dakota due to the Bakken oil field activity which is also beginning to impact Montana-Dakota's electric sales in Montana.

At the time this analysis was begun (June 2012), the most recent year for which a complete set of weather, prices, monthly sales by sector, and other historical information was available was for year-ending 2011. The equations developed used historical data available through 2011 and were designed to forecast the time period 2012-2032.

Montana-Dakota's Integrated System consists of the counties listed in the table below. These counties are located in eastern Montana, north-central South Dakota, and western and central North Dakota.

Counties by State in Montana-Dakota's Integrated System

<u>Montana</u>	<u>South Dakota</u>	<u>North Dakota</u>	
Custer	Campbell	Adams	Logan
Daniels	Corson	Bowman	McIntosh
Dawson	Edmunds	Burke	McKenzie
Fallon	Faulk	Burleigh	Mercer
Prairie	Harding	Dickey	Morton
Richland	McPherson	Divide	Mountrail
Roosevelt	Perkins	Dunn	Oliver
Rosebud	Potter	Emmons	Renville
Sheridan	Walworth	Golden Valley	Slope
Wibaux		Grant	Stark
		Hettinger	Williams
		Kidder	

Montana-Dakota also provides electric service to a small part of Brown county of South Dakota. However, Brown County is excluded from the database because it includes the town of Aberdeen which is not served by Montana-Dakota but which comprises the majority of the population for the county. Including Brown county would reflect too much of the economic activity that occurs in Aberdeen.

1. Forecast Methodology – Sales

The Montana, North Dakota, and South Dakota sales forecasts are disaggregated into five sales sectors:

- Residential sector.
- Small Commercial & Industrial (SC&I) sector. This sector consists of those commercial and industrial customers whose monthly peak demand averages less than 50 kilowatts over a year's time.
- Large Commercial & Industrial (LC&I) sector. This sector consists of those commercial and industrial customers whose monthly peak demand averages more than 50 kilowatts over a year's time.
- Street Lighting. This sector consists of energy for public street and highway lighting.
- Miscellaneous. This sector includes energy for sales to other public authorities, interdepartmental sales, and company use.

The LC&I sector was further broken down into six end-use categories which were forecasted individually. The remainder of the LC&I sales fall into a seventh category: General LC&I sales. The end-uses forecasted individually were as follows:

- North Dakota
 - Tesoro Refinery sales in Mandan
 - Dakota Westmoreland Coal Mining sales at Beulah and Coyote
 - Sabin Metals sales in Williston
- Montana
 - Westmoreland Coal Mining sales at Savage
 - Montana Oil Field sales
 - Keystone XL Pipeline

Econometric equations were tried initially in the development of the forecasted sales for the three primary customer categories by state – residential, SC&I, and General LC&I – while sales forecasts for the street lighting and miscellaneous sectors were developed primarily using linear regression. The final models used for each of the primary customer categories were a combination of econometrics and judgment. The sales forecasts for the six LC&I end-uses were developed using a combination of regressions and information available from Montana-Dakota's field personnel regarding these large customers.

The development of the sales forecasts for each of the five sales sectors is explained below.

1.1. Residential

The residential sales forecast is derived by developing a forecast of residential use per customer and a forecast of number of residential customers. The complete details of the projected residential use per customer and number of customers as well as the projected residential sales by state are given in Section 3 – Forecast Results.

RESIDENTIAL USE PER CUSTOMER

North Dakota and Montana – Initially, the residential use per customer forecasts for each state were developed using the same econometric process that had been used in previous years. However, in Montana and North Dakota, use per customer increased at a faster rate than expected despite the many gains in efficiency being made in lighting and other electric devices. The Electric Power Research Institute projects that demand is expected to decline by about 0.5% per year for the next ten years. Therefore, a modification was made to Montana and North Dakota use per residential customer to reflect the reduction in residential power use that is expected. The final residential use per customer models for Montana and North Dakota have use per customer growing at 0.5% per year.

South Dakota – The econometric process used in previous years allowed residential sales to depend on variables such as the residential price of electricity, alternate fuel prices for residential customers (natural gas), personal income per household, heating degree days, cooling degree days, number of households, and year. The forecast for South Dakota residential use per customer continues to be developed in this way.

Higher electricity prices and lower income may result in less electricity use, while higher alternate fuel prices as well as colder than normal winters (more heating degree days) and hotter than normal summers (more cooling degree days) may result in more electricity consumption. Historical and forecasted values for these variables are available and were tested for statistical significance in developing the residential econometric equation. The historical and forecasted values for these variables are given in Appendix B.

The final use per residential customer model for South Dakota is as follows:

$$\ln(res_upc_t) = a + b^{CDD} \times CDD_t + b^{HDD} \times HDD_t \\ + b^{ElecP} \times \ln(res_pr_elec_t) + e_t$$

where:

\ln = natural logarithm;
 res_upc_t = residential use per customer;
 CDD_t = cooling degree days;
 HDD_t = heating degree days; and
 $res_pr_elec_t$ = real residential price of electricity in SD

The a and the b 's are the estimated parameters, and e_t is the error term. All variables are actual calendar year values.

The Personal Consumption Expenditure Deflator was used to place residential electricity prices and residential natural gas prices into real dollar terms for the historical time period. See Appendix B-5 for the Personal Consumption Expenditure Deflator.

NUMBER OF RESIDENTIAL CUSTOMERS

The model initially developed for the number of customers (bills) for each state is as follows:

$$\ln(res_bills_t) = a + b^{hhld} \times \ln(hholds_t) + e_t$$

In this equation, a and b^{hhld} are estimated parameters; e_t is the error term, the dependent variable is the natural log of the number of bills and the only explanatory variable is the natural log of the number of households.

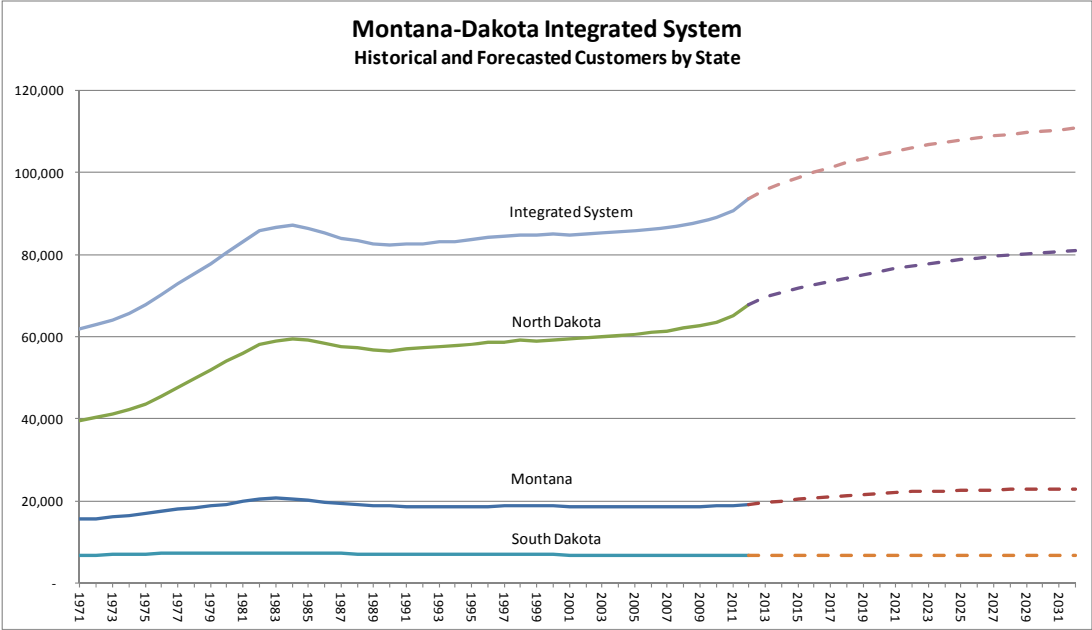
The base forecast for number of customers by state was developed as described above. Adjustments were then made to the residential customer forecasts for North Dakota and Montana to reflect the higher rate of growth being experienced in parts of North Dakota and Montana due to the Bakken oil field activity.

In North Dakota, customer growth for 2012 was set to the actual residential customer growth seen as of mid-2012. In 2013, residential customer growth was set to the actual growth seen in 2011, and in the following years, residential customer growth was allowed to gradually taper off to growth levels experienced prior to the development of the Bakken oil field.

For Montana where the Bakken development lags the development in North Dakota, customer growth for 2012 was set to the approximate residential customer growth seen in mid-2012. Residential customer growth was allowed to slowly ramp up in 2013 and 2014, and then

gradually decline to the growth levels experienced prior to the Bakken development.

Historical and forecasted customers (bills) by state and in total are plotted on the chart below while the values are given in Appendix B-6.



1.2. Small Commercial & Industrial

Small commercial & industrial (SC&I) sales could potentially depend on variables such as the SC&I price of electricity, alternate fuel prices for SC&I customers (natural gas), employment, heating degree days, cooling degree days, and year. Higher electricity prices may result in less electricity use, while higher alternate fuel prices and higher employment as well as colder than normal winters (more heating degree days) and hotter than normal summers (more cooling degree days) may result in more electricity consumption. Historical and forecasted values for these variables are available and were tested for statistical significance in developing the SC&I econometric equations by state. The historical and forecasted values for these variables are given in Appendix B.

In contrast to the residential sales forecast which uses two models for each state to project residential sales (a use per residential customer model and a residential customer numbers model), a single model for each state is used to forecast small commercial & industrial (SC&I) sales. The final models by state are as follows:

North Dakota:

$$\ln(\text{sci_kwh}_t) = a + b^{Emp} \times \ln(\text{emp_no_farm_mining}_t) + e_t$$

where:

ln = natural logarithm;
sci_kwh_t = small comm & industrial sales; and
emp_no_farm_mining_t = total employment, excluding farm and mining.

In this equation, *a* and the *b*'s are estimated parameters; *e_t* is the error term.

Montana:

$$\ln(\text{sci_kwh}_t) = a + b^{Emp} \times \ln(\text{emp_no_farm_mining}_t) + b^{Yr} \times \text{year}_t + e_t$$

where:

ln = natural logarithm;
sci_kwh_t = small commercial & industrial sales;
emp_no_farm_mining_t = total employment, excluding farm and mining; and
year_t = year (1989-2011), which serves as a time trend variable.

In this equation, *a* and the *b*'s are estimated parameters; *e_t* is the error term.

South Dakota:

$$\ln(\text{sci_kwh}_t) = a + b^{HDD} \times HDD_t + b^{Emp} \times \ln(\text{emp_no_farm_mining}_t) + b^{Yr} \times \text{year}_t + e_t$$

where:

ln = natural logarithm;
sci_kwh_t = small commercial & industrial sales;
HDD_t = heating degree days;

emp_no_farm_mining_t = total employment, excluding farm and mining; and
year_t = year (1989-2011), which serves as a time trend variable.

In this equation, *a* and the *b*'s are estimated parameters; *e_t* is the error term.

The Personal Consumption Expenditure Deflator, whose values are given on Appendix B-5, was used to place small commercial and industrial electricity prices and firm natural gas prices into real dollar terms for both the historical and forecasted time periods.

Employment numbers are available from W&P for the historical time period from the U.S. Department of Commerce, Bureau of Economic Analysis. Employment projections for the counties served by Montana-Dakota are made by W&P. Actual historical ten-year growth (1999-2009) in employment for South Dakota was 0.22% per year which was the same growth projected by W&P for the next twenty years. This employment projection resulted in a reasonable growth rate for South Dakota SC&I sales. However, due to the Bakken oil field activity in North Dakota and Montana, it is anticipated that employment will grow faster than what was projected by W&P.

Since residential customer number forecasts had been developed for North Dakota and Montana reflecting the higher rate of growth due to the Bakken activity as described in Section 1.1, it was decided that a relationship between residential customer numbers and employment should be established in order that the SC&I sales forecast would correspond to the residential customer number forecast and the growth in employment and residential customers would be directly correlated. Regressions were run on 25-year ratios of historical employment (total employment less farming and mining) to residential customers. The forecasted ratio produced from this regression was applied to the adjusted residential customer forecasts for both North Dakota and Montana to arrive at the adjusted employment forecasts for each state. Historical employment as well as employment as forecasted by W&P and as adjusted is given on Appendix B-7.

1.3. Large Commercial & Industrial

The sales forecasts for the six LC&I end-uses (Tesoro Refinery, Westmoreland and Dakota Westmoreland, Sabin Metals, Montana Oil Fields, and Keystone XL Pipeline) were developed using a

combination of regressions and information available from Montana-Dakota's field personnel regarding these large customers.

General LC&I

General LC&I sales (sales to all other LC&I customers that are not to the Tesoro Refinery, Westmoreland Coal, Montana Oil Fields, Sabin Metals, or Keystone XL Pipeline) could depend on variables such as the LC&I price of electricity, alternate fuel prices for LC&I customers (natural gas), heating degree days, cooling degree days, employment, and year. Higher electricity prices can result in less electricity use, while higher alternate fuel prices and higher employment as well as colder than normal winters (more heating degree days) and hotter than normal summers (more cooling degree days) could result in more electricity consumption. Historical and forecasted values for these variables are available and were tested for statistical significance in developing the General LC&I econometric equations by state.

As with SCI sales, general large commercial & industrial (LCI) sales are forecast using a single model. The forecast process began in each state by estimating the full models and then removing variables for which the estimated coefficient either has the wrong sign or is not statistically significant. The final models for each state were identical with the only statistically significant variable being the time-trend variable.

The final model for North Dakota, South Dakota and Montana is as follows:

$$\ln(lci_kwh_t) = a + b^{yr} \times year + e_t$$

where:

\ln	= natural logarithm;
lci_kwh_t	= large commercial & industrial sales;
$year_t$	= year (1989-2011), which serves as a time trend variable.

In this equation, a and the b are estimated parameters; e_t is the error term.

After the General LC&I sales are projected by state using the equation developed as outlined above, adjustments are made to the projected sales in each state to reflect additional load growth that is expected due to the addition of several new General LC&I customers that are in the process of being added or that will be added in 2012, 2013, 2014, and 2015. Information regarding the specific LC&I customers that are

expected to come on line is provided by Montana-Dakota's field personnel who have contact with and closely monitor these customers.

1.4. Street Lighting

The sales forecast for the street lighting sector (public street and highway lighting) for each state was held constant at the actual 2011 levels.

1.5. Miscellaneous

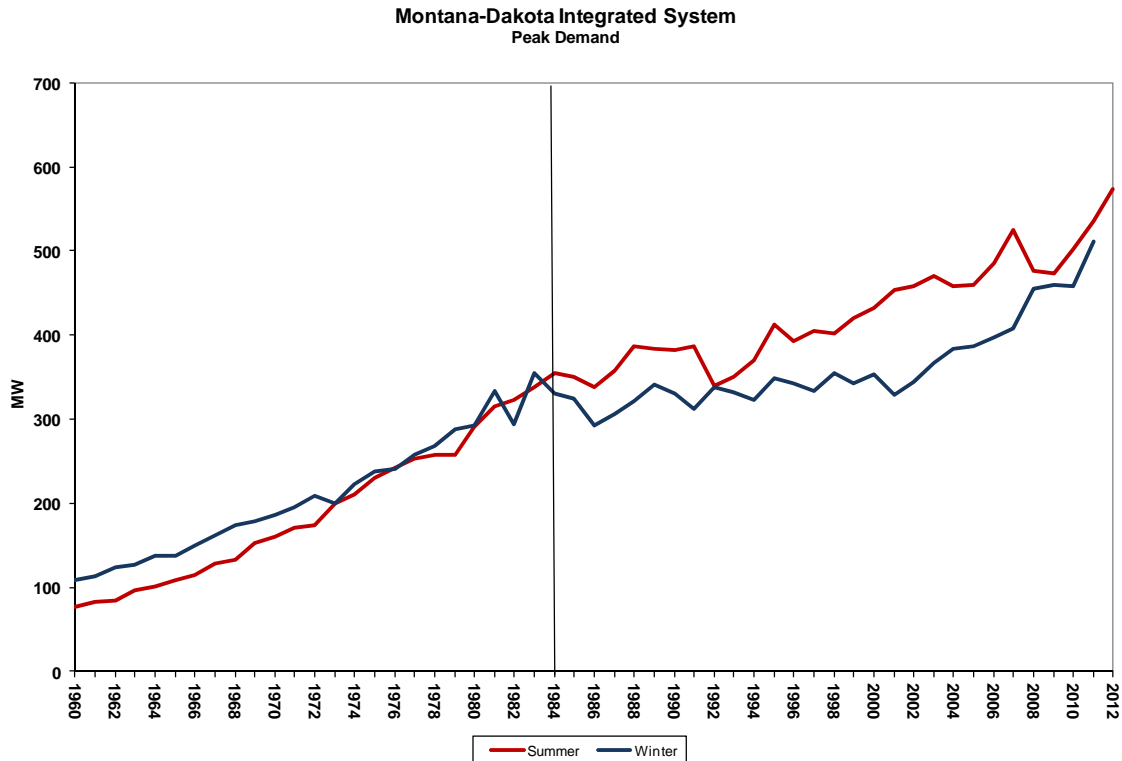
The miscellaneous sales sector is made up of sales for the following three end-uses:

1. Interdepartmental Sales – gas utility use of electricity
2. Other Public Sales – sales to government authorities which includes municipal pumping and some city sales (these sales are served under special contracts that are applicable only to public authorities)
3. Company Use - Montana-Dakota offices

The forecasts for Interdepartmental Sales and Company Use for each state were held constant at the actual 2011 levels. The forecast for Other Public Sales was held constant at the actual 2011 level for South Dakota, while the Other Public Sales forecast for both North Dakota and Montana were based on a linear regression on actual 1992-2011 sales in each state.

2. Forecast Methodology – Peak Demand

Integrated System historical peak demand is shown on the chart below.



Montana-Dakota was a winter peaking utility prior to 1984. From about 1973 to 1983, the spread between the winter and summer peaks began to narrow and in 1984 Montana-Dakota became a summer peaking utility. From Montana-Dakota's Residential Energy Use Surveys and other available information, it is known that air conditioning is becoming more prevalent over time and air conditioning load is driving much of the increase in summer peak demand. Recently the winter peak has been growing at a faster rate again due to the addition of more space heating load and the gap between winter and summer seasonal peaks has narrowed once more.

The Integrated System peak demand forecast is developed on a total system basis; it is not disaggregated by state or by sector. The summer peak demand forecast was developed through the use of an econometric model. Peak day/hour temperature, annual cooling degree days, total system sales for the year including losses (annual requirements), and a time-trend variable (year) were tested as the independent variables in the econometric model.

For peak day temperature, Montana-Dakota has available the historical hourly temperatures for three major load centers: Bismarck, ND; Williston, ND; and Miles City, MT. Weighted average temperatures for Bismarck (70%), Miles City (15%) and Williston (15%) at the time of the system peak were used as the peak day temperature. This weighting method has been tested and used in the company's short-term demand forecast as well as in other informal in-house analyses. The inclusion of cooling degree days in the model is based on the fact that Montana-Dakota is a summer peaking utility and that hotter summers create more hot days on which high peaks may be set and may also serve as a proxy for heat buildup on the peak day.

Because of the nature of the econometric models, the historical summer peak demand data were adjusted to reflect customer load interruptions due to Interruptible Rate 38/39 and/or forced distribution outages that occurred at the time of the summer peak. The historical summer peak value thus represents the peak as it would have occurred had there not been any interruptions. Interruptions to the load for customers served on Large Power Demand Response Rate 38 and/or Interruptible Large Power Service Rate 39 typically occur at the time of the system peak. Also, a forced distribution outage occurred at the time of the summer peak in 2002 and voltage reductions were implemented at the time of the summer peaks in 2006 and 2007.

The summer peak demand model is as follows:

$$\ln(\text{peak_load}_t) = a + b^{CDD} \times CDD_t + b^{PTemp} \times \text{peak_temp}_t + b^{Sales} \times \ln(\text{system_kwh}_t) + b^{yr} \times \text{year}_t + e_t$$

where:

\ln	= natural logarithm;
peak_load_t	= summer peak demand;
CDD_t	= cooling degree days;
peak_temp_t	= weighted average temp at time of summer peak;
system_kwh_t	= annual energy requirements; and
year_t	= year (1984-2011), which serves as a time trend variable.

In this equation, a and the b 's are estimated parameters; e_t is the error term.

The winter peak demand forecast is developed in a manner similar to the summer peak demand forecast except that HDDs were tested for statistical significance in the model rather than CDDs. It was found that HDDs are not statistically significant.

For the winter peak demand forecast, several other variables were tested to see if they play a statistically significant role in the determination of the winter

peak. The variables tested were the number of minutes of daylight on the day of the winter peak, the number of days between the winter peak and the winter solstice, and a variable for a Christmas lighting switch to indicate whether or not Christmas lighting was in use at the time of the winter peak (Christmas lighting is “on” if the peak occurs within two weeks prior to Christmas and one week after, and the Christmas lighting switch is “off” if the winter peak occurs outside of that window.) It was found that modeling whether or not Christmas lighting is on at the time of the winter peak is statistically significant.

The winter peak demand model is as follows:

$$\begin{aligned}
 peak_load_t &= a + b^{PTemp} \times peak_temp_t \\
 &+ b^{Sales} \times system_kwh_t \\
 &+ b^{LtgSwch} \times ltg_expected_value
 \end{aligned}$$

where:

$peak_load_t$ = winter peak demand;
 $peak_temp_t$ = weighted average temp at time of winter peak;
 $system_kwh_t$ = annual energy requirements; and
 $ltg_expected_value$ = expected value that Christmas Lighting will be “on” at the time of the winter peak.

In this equation, a and the b 's are estimated parameters; e_t is the error term.

3. Forecast Results – Sales and Demand

The forecast methodology for both sales and demand as described in Sections 1 and 2 above results in the initial sales forecasts by sales class for each state and the initial demand forecast. Reductions to the sales forecasts by class and by state and to the demand forecast are made to reflect Demand-Side Management programs that are being implemented. Once these reductions are reflected in the sales forecasts, the total of the sales forecasts by class are adjusted by the loss factor to arrive at the final forecast of energy requirements.

3.1. Demand-Side Management (DSM) Reductions

As reflected in the 2011 Integrated Resource Plans (IRP) filed with the North Dakota and Montana Public Service Commissions, Montana-Dakota has established goals for both energy efficiency and demand response levels over the 20 year planning period of the IRPs. The specific programs used to attain the goals may change over the planning period, but will include both energy efficiency and demand response programs that are deemed cost effective.

The forecasted reduction based on the goals for energy and peak demand is reflected in the forecast and those goals are summarized below:

- DSM Energy savings
 - 0.18 percent of annual sales by 2013
 - 0.25 percent of annual sales for 2014 through 2030
- Peak Demand savings
 - Demand Response programs of 48 MW by 2015
 - Energy Efficiency programs of 1.5 MW by 2015
 - Total DSM peak demand savings of 49.5 MW for 2015-2030

The forecasted reduction in energy and peak demand resulting from the above programs is reflected in the forecast.

3.2. Losses

The sales forecasts reflect the energy delivered to Montana-Dakota's customers' meters. The total amount of electricity generated at the power plants to meet Montana-Dakota's customers' energy needs is

greater than what is delivered to the meters and is called the 'Total Energy Requirements.' The difference between the sales and energy requirements reflects the losses that occur within the transmission and distribution system.

The annual energy losses percentage, defined as a fraction of the total annual energy requirements, has varied from year to year. Therefore, these loss percentages are averaged over a ten-year time period. The average value for the past ten years is 7.929%. Using this value for all future years for each state, the total energy requirements are calculated for each year during the study period.

3.3. Final Energy Requirements Forecast

The forecasted sales and system peak demand are first adjusted to reflect the effects of the DSM programs that are being implemented as explained in Section 3.1 and then adjusted for losses as outlined in Section 3.2 to calculate the total energy requirements and peak demand forecast. This is the amount of energy and capacity that needs to be generated or purchased to meet Montana-Dakota's customers' energy needs.

The final forecast results are presented on the following several pages. A table summarizing the Integrated System energy requirements and seasonal peak demand is given first, followed by a graph with historical and forecasted seasonal peak demand and energy requirements. A table summarizing historical and forecasted sales by sales sector for Montana, North Dakota, South Dakota, and the Integrated System in total is given next, followed by a graph of the Integrated System data. A table detailing the historical and forecasted residential sales, customers, and use per customer by state is given next. The last page of this section is a similar table for the Integrated System in total.

Refer to Appendices C-1 through C-7 for graphs of the historical and forecasted sales by sector.

Montana-Dakota Utilities Co.
Historical and Forecasted Energy and Demand
Integrated System
Reflecting Demand-Side Management Programs from 2011 IRP
Calendar Month Basis

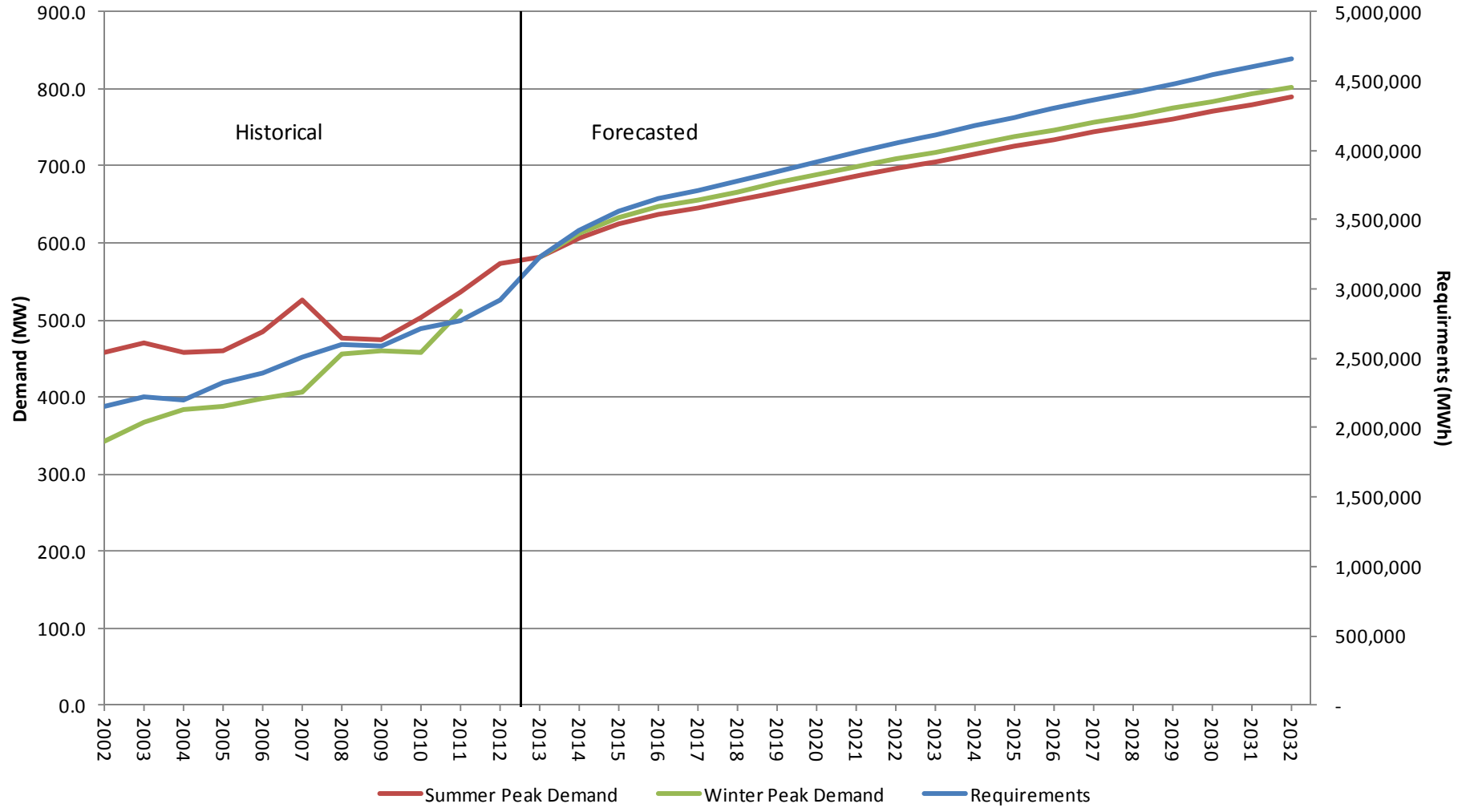
Year	Total Energy Requirements (net of DSM and EE)		Summer Peak - MW				Winter Peak 2/		Demand Response		
	MWh	% Change	<u>Total Demand</u>	<u>Energy</u>	<u>Demand</u>	% Change	MW	% Change	<u>Rate 38/39</u>	<u>Residential</u>	<u>Commercial</u>
			<u>Before any</u>	<u>Efficiency</u>	<u>Net of</u>				<u>Interrupt</u>	<u>AC Demand</u>	<u>Demand</u>
			<u>DSM or EE</u>	<u>(EE)</u>	<u>EE 1/</u>			<u>Loads</u>	<u>Response</u>	<u>Response</u>	
2002	2,158,431				458.8		343.5				
2003	2,226,531	3.16%			470.5	2.55%	367.7	7.05%			
2004	2,204,012	-1.01%			458.4	-2.57%	383.9	4.41%			
2005	2,327,117	5.59%			459.1	0.15%	387.2	0.86%			
2006	2,397,793	3.04%			485.5	5.75%	397.2	2.58%			
2007	2,510,540	4.70%			525.6	8.26%	407.3	2.54%			
2008	2,596,990	3.44%			476.6	-9.32%	455.0	11.71%			
2009	2,593,368	-0.14%			473.8	-0.59%	459.6	1.01%			
2010	2,718,192	4.81%			502.5	6.06%	457.8	-0.39%			
2011	2,776,082	2.13%			535.8	6.63%	510.8	11.58%			
2012	2,919,752	5.18%			573.6	7.05%	not yet available				
2013	3,229,369	10.60%	583.6	1.3	582.3	1.51%	582.0		11.8	4.0	15.0
2014	3,428,355	6.16%	608.5	1.5	607.0	4.25%	612.6	5.25%	13.0	10.0	25.0
2015	3,566,791	4.04%	626.6	1.5	625.1	2.97%	633.9	3.47%	13.0	10.0	25.0
2016	3,658,701	2.58%	639.3	1.5	637.8	2.04%	648.0	2.23%	13.0	10.0	25.0
2017	3,707,826	1.34%	647.2	1.5	645.7	1.24%	655.5	1.16%	13.0	10.0	25.0
2018	3,778,809	1.91%	657.6	1.5	656.1	1.61%	666.4	1.66%	13.0	10.0	25.0
2019	3,849,868	1.88%	668.0	1.5	666.5	1.58%	677.3	1.64%	13.0	10.0	25.0
2020	3,917,073	1.75%	678.0	1.5	676.5	1.49%	687.7	1.52%	13.0	10.0	25.0
2021	3,985,719	1.75%	688.1	1.5	686.6	1.50%	698.2	1.53%	13.0	10.0	25.0
2022	4,051,562	1.65%	697.9	1.5	696.4	1.43%	708.3	1.45%	13.0	10.0	25.0
2023	4,116,212	1.60%	707.5	1.5	706.0	1.39%	718.3	1.40%	13.0	10.0	25.0
2024	4,178,028	1.50%	716.9	1.5	715.4	1.32%	727.7	1.32%	13.0	10.0	25.0
2025	4,241,515	1.52%	726.4	1.5	724.9	1.33%	737.5	1.34%	13.0	10.0	25.0
2026	4,302,729	1.44%	735.7	1.5	734.2	1.28%	746.9	1.27%	13.0	10.0	25.0
2027	4,363,792	1.42%	744.9	1.5	743.4	1.26%	756.3	1.26%	13.0	10.0	25.0
2028	4,422,149	1.34%	753.9	1.5	752.4	1.20%	765.2	1.19%	13.0	10.0	25.0
2029	4,481,277	1.34%	762.9	1.5	761.4	1.20%	774.3	1.19%	13.0	10.0	25.0
2030	4,541,269	1.34%	772.1	1.5	770.6	1.20%	783.5	1.19%	13.0	10.0	25.0
2031	4,602,215	1.34%	781.3	1.5	779.8	1.20%	792.9	1.19%	13.0	10.0	25.0
2032	4,663,964	1.34%	790.6	1.5	789.1	1.20%	802.4	1.20%	13.0	10.0	25.0

1/ Historical demand reported is system actual demand.

2/ Winter Peak is for Nov-Dec of current year and Jan-Apr of following year.

Montana-Dakota Integrated System

Energy Requirements and Summer and Winter Season Peak Demand



Montana-Dakota Utilities Co.
Historical and Forecasted Annual Sales by Sector
Montana
Billing Month Basis
Reflecting Demand-Side Programs

YEAR	<u>Residential</u>		<u>Small C&I</u>		<u>Large C&I</u>		<u>Street Lighting</u>		<u>Miscellaneous</u>		<u>Total Sales</u>	
	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change
2002	147,916		96,252		306,160		7,241		7,539		565,108	
2003	153,518	3.79%	100,463	4.37%	340,070	11.08%	7,208	-0.46%	7,683	1.91%	608,942	7.76%
2004	141,249	-7.99%	98,151	-2.30%	348,097	2.36%	7,250	0.58%	7,357	-4.24%	602,104	-1.12%
2005	150,706	6.70%	102,046	3.97%	364,489	4.71%	7,232	-0.25%	7,131	-3.07%	631,604	4.90%
2006	157,206	4.31%	104,214	2.12%	368,666	1.15%	7,203	-0.40%	7,621	6.87%	644,910	2.11%
2007	162,186	3.17%	109,101	4.69%	385,230	4.49%	7,187	-0.22%	7,456	-2.17%	671,160	4.07%
2008	162,182	0.00%	108,595	-0.46%	408,686	6.09%	7,244	0.79%	7,637	2.43%	694,344	3.45%
2009	167,421	3.23%	110,380	1.64%	407,647	-0.25%	7,244	0.00%	7,701	0.84%	700,393	0.87%
2010	171,661	2.53%	109,188	-1.08%	415,946	2.04%	7,203	-0.57%	7,511	-2.47%	711,509	1.59%
2011	185,153	7.86%	119,643	9.58%	427,887	2.87%	7,089	-1.58%	7,789	3.70%	747,561	5.07%
2012	187,635	1.34%	132,714	10.93%	420,459	-1.74%	7,106	0.24%	8,134	4.43%	756,048	1.14%
2013	194,014	3.40%	130,579	-1.61%	476,176	13.25%	7,089	-0.24%	7,793	-4.19%	815,651	7.88%
2014	198,820	2.48%	135,919	4.09%	541,496	13.72%	7,089	0.00%	7,794	0.01%	891,118	9.25%
2015	203,299	2.25%	141,027	3.76%	594,105	9.72%	7,089	0.00%	7,796	0.03%	953,316	6.98%
2016	207,837	2.23%	146,271	3.72%	617,580	3.95%	7,089	0.00%	7,797	0.01%	986,574	3.49%
2017	211,892	1.95%	151,176	3.35%	623,762	1.00%	7,089	0.00%	7,798	0.01%	1,001,717	1.53%
2018	215,999	1.94%	156,203	3.33%	629,985	1.00%	7,089	0.00%	7,800	0.03%	1,017,076	1.53%
2019	219,627	1.68%	160,863	2.98%	636,251	0.99%	7,089	0.00%	7,801	0.01%	1,031,631	1.43%
2020	223,279	1.66%	165,614	2.95%	642,560	0.99%	7,089	0.00%	7,802	0.01%	1,046,344	1.43%
2021	226,454	1.42%	169,981	2.64%	648,912	0.99%	7,089	0.00%	7,804	0.03%	1,060,240	1.33%
2022	229,660	1.42%	174,426	2.61%	655,308	0.99%	7,089	0.00%	7,805	0.01%	1,074,288	1.32%
2023	231,845	0.95%	177,933	2.01%	661,750	0.98%	7,089	0.00%	7,807	0.03%	1,086,424	1.13%
2024	234,040	0.95%	181,502	2.01%	668,237	0.98%	7,089	0.00%	7,808	0.01%	1,098,676	1.13%
2025	236,246	0.94%	185,115	1.99%	674,771	0.98%	7,089	0.00%	7,809	0.01%	1,111,030	1.12%
2026	238,486	0.95%	188,798	1.99%	681,353	0.98%	7,089	0.00%	7,811	0.03%	1,123,537	1.13%
2027	240,735	0.94%	192,527	1.98%	687,982	0.97%	7,089	0.00%	7,812	0.01%	1,136,145	1.12%
2028	242,462	0.72%	195,773	1.69%	694,661	0.97%	7,089	0.00%	7,813	0.01%	1,147,798	1.03%
2029	244,206	0.72%	199,056	1.68%	701,389	0.97%	7,089	0.00%	7,815	0.03%	1,159,555	1.02%
2030	245,966	0.72%	202,391	1.68%	708,168	0.97%	7,089	0.00%	7,816	0.01%	1,171,430	1.02%
2031	247,743	0.72%	205,770	1.67%	715,010	0.97%	7,089	0.00%	7,818	0.03%	1,183,430	1.02%
2032	249,526	0.72%	209,201	1.67%	721,904	0.96%	7,089	0.00%	7,819	0.01%	1,195,539	1.02%
2002-2012 Average Yearly Growth												
(10 Years History) 2.55%												
2007-2012 Average Yearly Growth												
(5 Years History) 3.34%												
2013-2018 Average Yearly Growth												
(5 Years) 2.17%												
2013-2023 Average Yearly Growth												
(10 Years) 1.80%												
2013-2032 Average Yearly Growth												
(19 Years) 1.33%												

Montana-Dakota Utilities Co.
Historical and Forecasted Annual Sales by Sector
North Dakota
Billing Month Basis
Reflecting Demand-Side Programs

YEAR	<u>Residential</u>		<u>Small C&I</u>		<u>Large C&I</u>		<u>Street Lighting</u>		<u>Miscellaneous</u>		<u>Total Sales</u>	
	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change
2002	510,649		223,725		534,096		20,846		38,771		1,328,087	
2003	518,363	1.51%	230,831	3.18%	538,715	0.86%	20,965	0.57%	39,208	1.13%	1,348,082	1.51%
2004	482,828	-6.86%	224,924	-2.56%	532,079	-1.23%	20,633	-1.58%	37,519	-4.31%	1,297,983	-3.72%
2005	525,133	8.76%	250,022	11.16%	563,793	5.96%	20,484	-0.72%	39,346	4.87%	1,398,778	7.77%
2006	550,071	4.75%	274,728	9.88%	564,963	0.21%	20,772	1.41%	43,337	10.14%	1,453,871	3.94%
2007	568,710	3.39%	299,602	9.05%	570,170	0.92%	20,948	0.85%	43,819	1.11%	1,503,249	3.40%
2008	585,609	2.97%	320,093	6.84%	583,502	2.34%	21,201	1.21%	43,308	-1.17%	1,553,713	3.36%
2009	609,179	4.02%	340,496	6.37%	551,114	-5.55%	20,582	-2.92%	43,934	1.45%	1,565,305	0.75%
2010	632,068	3.76%	382,985	12.48%	530,341	-3.77%	20,373	-1.02%	43,216	-1.63%	1,608,983	2.79%
2011	687,465	8.76%	450,098	17.52%	514,238	-3.04%	20,059	-1.54%	46,265	7.06%	1,718,125	6.78%
2012	700,451	1.89%	512,566	13.88%	492,981	-4.13%	20,076	0.08%	48,519	4.87%	1,774,593	3.29%
2013	739,464	5.57%	556,517	8.57%	658,608	33.60%	20,060	-0.08%	44,593	-8.09%	2,019,242	13.79%
2014	755,457	2.16%	585,157	5.15%	722,722	9.73%	20,060	0.00%	44,852	0.58%	2,128,248	5.40%
2015	769,977	1.92%	612,141	4.61%	746,873	3.34%	20,060	0.00%	45,110	0.58%	2,194,161	3.10%
2016	783,547	1.76%	638,520	4.31%	760,842	1.87%	20,060	0.00%	45,369	0.57%	2,248,338	2.47%
2017	797,216	1.74%	665,776	4.27%	747,110	-1.80%	20,060	0.00%	45,627	0.57%	2,275,789	1.22%
2018	809,889	1.59%	692,258	3.98%	756,193	1.22%	20,060	0.00%	45,886	0.57%	2,324,286	2.13%
2019	822,736	1.59%	719,524	3.94%	765,381	1.22%	20,060	0.00%	46,144	0.56%	2,373,845	2.13%
2020	834,556	1.44%	745,858	3.66%	774,687	1.22%	20,060	0.00%	46,403	0.56%	2,421,564	2.01%
2021	846,453	1.43%	772,907	3.63%	784,138	1.22%	20,060	0.00%	46,662	0.56%	2,470,220	2.01%
2022	857,313	1.28%	798,851	3.36%	792,029	1.01%	20,060	0.00%	46,920	0.55%	2,515,173	1.82%
2023	868,317	1.28%	825,438	3.33%	800,045	1.01%	20,060	0.00%	47,179	0.55%	2,561,039	1.82%
2024	878,263	1.15%	850,736	3.06%	808,198	1.02%	20,060	0.00%	47,437	0.55%	2,604,694	1.70%
2025	888,265	1.14%	876,605	3.04%	816,468	1.02%	20,060	0.00%	47,696	0.55%	2,649,094	1.70%
2026	897,266	1.01%	900,977	2.78%	824,879	1.03%	20,060	0.00%	47,955	0.54%	2,691,137	1.59%
2027	906,313	1.01%	925,865	2.76%	833,398	1.03%	20,060	0.00%	48,213	0.54%	2,733,849	1.59%
2028	914,257	0.88%	949,100	2.51%	842,076	1.04%	20,060	0.00%	48,472	0.54%	2,773,965	1.47%
2029	922,236	0.87%	972,727	2.49%	850,878	1.05%	20,060	0.00%	48,730	0.53%	2,814,631	1.47%
2030	930,317	0.88%	996,761	2.47%	859,818	1.05%	20,060	0.00%	48,989	0.53%	2,855,945	1.47%
2031	938,481	0.88%	1,021,238	2.46%	868,946	1.06%	20,060	0.00%	49,247	0.53%	2,897,972	1.47%
2032	946,680	0.87%	1,046,131	2.44%	878,217	1.07%	20,060	0.00%	49,506	0.53%	2,940,594	1.47%

Note: A reclassification of approximately 140 customers took place in the July/August 2011 time frame and subsequent years reflect this reclassification.

2002-2012 Average Yearly Growth (10 Years History)	3.59%	8.71%	-0.55%	-0.34%	2.23%	3.10%
2007-2012 Average Yearly Growth (5 Years History)	4.56%	11.55%	-3.22%	-1.11%	1.99%	3.37%
2013-2018 Average Yearly Growth (5 Years)	1.84%	4.46%	2.80%	0.00%	0.57%	2.85%
2013-2023 Average Yearly Growth (10 Years)	1.62%	4.02%	1.96%	0.00%	0.57%	2.41%
2013-2032 Average Yearly Growth (19 Years)	1.31%	3.38%	1.53%	0.00%	0.55%	2.00%

Montana-Dakota Utilities Co.
Historical and Forecasted Annual Sales by Sector
South Dakota
Billing Month Basis
Reflecting Demand-Side Programs

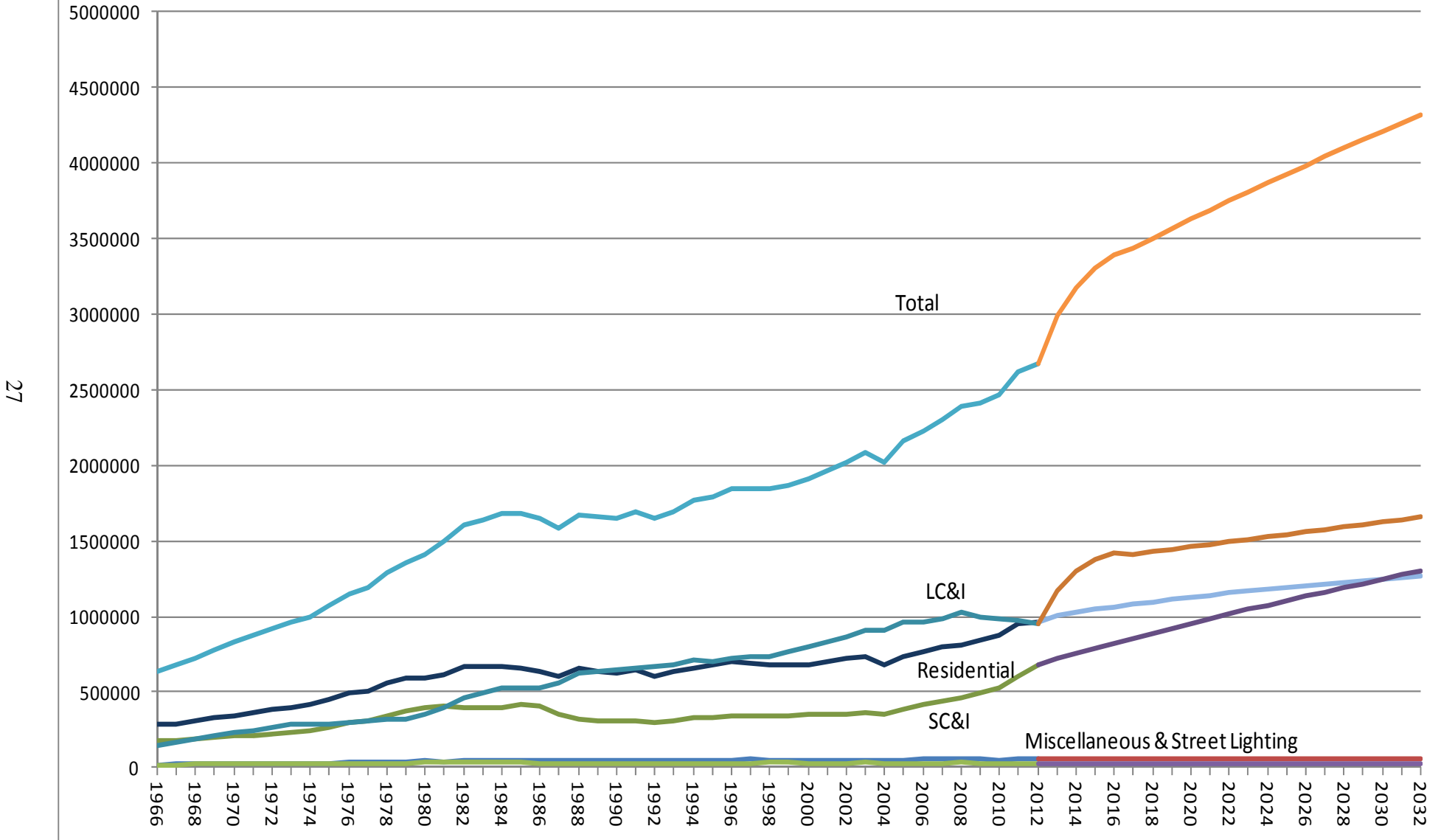
YEAR	<u>Residential</u>		<u>Small C&I</u>		<u>Large C&I</u>		<u>Street Lighting</u>		<u>Miscellaneous</u>		<u>Total Sales</u>	
	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change
2002	61,780		33,801		26,645		2,692		3,077		127,995	
2003	61,149	-1.02%	33,964	0.48%	27,075	1.61%	2,684	-0.30%	3,121	1.43%	127,993	0.00%
2004	56,536	-7.54%	32,909	-3.11%	27,091	0.06%	2,672	-0.45%	3,185	2.05%	122,393	-4.38%
2005	61,267	8.37%	34,679	5.38%	28,886	6.63%	2,660	-0.45%	2,851	-10.49%	130,343	6.50%
2006	61,676	0.67%	34,206	-1.36%	28,556	-1.14%	2,626	-1.28%	2,513	-11.86%	129,577	-0.59%
2007	63,018	2.18%	35,211	2.94%	29,271	2.50%	2,638	0.46%	2,678	6.57%	132,816	2.50%
2008	67,104	6.48%	36,966	4.98%	30,891	5.53%	2,636	-0.08%	2,761	3.10%	140,358	5.68%
2009	69,689	3.85%	39,395	6.57%	32,856	6.36%	2,607	-1.10%	2,047	-25.86%	146,594	4.44%
2010	70,868	1.69%	37,313	-5.28%	34,339	4.51%	2,639	-1.23%	1,535	-25.01%	146,694	0.07%
2011	73,977	4.39%	36,712	-1.61%	34,945	1.76%	2,628	-0.42%	1,729	12.64%	149,991	2.25%
2012	69,097	-6.60%	34,639	-5.65%	35,388	1.27%	2,620	-0.30%	1,811	4.74%	143,555	-4.29%
2013	71,459	3.42%	37,424	8.04%	38,229	8.03%	2,628	0.31%	1,729	-4.53%	151,469	5.51%
2014	72,156	0.98%	37,869	1.19%	39,096	2.27%	2,628	0.00%	1,729	0.00%	153,478	1.33%
2015	71,296	-1.19%	38,340	1.24%	40,059	2.46%	2,628	0.00%	1,729	0.00%	154,052	0.37%
2016	68,742	-3.58%	38,802	1.21%	41,035	2.44%	2,628	0.00%	1,729	0.00%	152,936	-0.72%
2017	69,128	0.56%	39,258	1.18%	42,047	2.47%	2,628	0.00%	1,729	0.00%	154,790	1.21%
2018	69,512	0.56%	39,754	1.26%	43,074	2.44%	2,628	0.00%	1,729	0.00%	156,697	1.23%
2019	69,918	0.58%	40,231	1.20%	44,139	2.47%	2,628	0.00%	1,729	0.00%	158,645	1.24%
2020	68,093	-2.61%	40,722	1.22%	45,231	2.47%	2,628	0.00%	1,729	0.00%	158,403	-0.15%
2021	67,634	-0.67%	41,220	1.22%	46,339	2.45%	2,628	0.00%	1,729	0.00%	159,550	0.72%
2022	68,035	0.59%	41,732	1.24%	47,488	2.48%	2,628	0.00%	1,729	0.00%	161,612	1.29%
2023	68,429	0.58%	42,229	1.19%	48,666	2.48%	2,628	0.00%	1,729	0.00%	163,681	1.28%
2024	67,980	-0.66%	42,739	1.21%	49,862	2.46%	2,628	0.00%	1,729	0.00%	164,938	0.77%
2025	68,397	0.61%	43,267	1.24%	51,101	2.48%	2,628	0.00%	1,729	0.00%	167,122	1.32%
2026	68,821	0.62%	43,778	1.18%	52,360	2.46%	2,628	0.00%	1,729	0.00%	169,316	1.31%
2027	68,374	-0.65%	44,303	1.20%	53,663	2.49%	2,628	0.00%	1,729	0.00%	170,697	0.82%
2028	68,798	0.62%	44,824	1.18%	54,987	2.47%	2,628	0.00%	1,729	0.00%	172,966	1.33%
2029	69,213	0.60%	45,361	1.20%	56,358	2.49%	2,628	0.00%	1,729	0.00%	175,289	1.34%
2030	69,617	0.58%	45,903	1.19%	57,763	2.49%	2,628	0.00%	1,729	0.00%	177,640	1.34%
2031	70,049	0.62%	46,438	1.17%	59,205	2.50%	2,628	0.00%	1,729	0.00%	180,049	1.36%
2032	70,467	0.60%	46,995	1.20%	60,683	2.50%	2,628	0.00%	1,729	0.00%	182,502	1.36%
2002-2012 Average Yearly Growth (10 Years History)		2.15%		1.04%		3.22%		-0.27%		-6.82%		1.90%
2007-2012 Average Yearly Growth (5 Years History)		2.22%		-0.45%		3.97%		-0.09%		-9.90%		1.70%
2013-2018 Average Yearly Growth (5 Years)		-0.55%		1.22%		2.42%		0.00%		0.00%		0.68%
2013-2023 Average Yearly Growth (10 Years)		-0.43%		1.22%		2.44%		0.00%		0.00%		0.78%
2013-2032 Average Yearly Growth (19 Years)		-0.07%		1.21%		2.46%		0.00%		0.00%		0.99%

Montana-Dakota Utilities Co.
Historical and Forecasted Annual Sales by Sector
Integrated System
Billing Month Basis
Reflecting Demand-Side Programs

YEAR	<u>Residential</u>		<u>Small C&I</u>		<u>Large C&I</u>		<u>Street Lighting</u>		<u>Miscellaneous</u>		<u>Total Sales</u>		<u>Total Energy Requirements</u>	
	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	Sales (MWh)	% Change	MWh	% Change
2002	720,345		353,778		866,901		30,779		49,387		2,021,190		2,158,431	
2003	733,030	1.76%	365,258	3.24%	905,860	4.49%	30,857	0.25%	50,012	1.27%	2,085,017	3.16%	2,226,531	3.16%
2004	680,613	-7.15%	355,984	-2.54%	907,267	0.16%	30,555	-0.98%	48,061	-3.90%	2,022,480	-3.00%	2,204,012	-1.01%
2005	737,106	8.30%	386,747	8.64%	957,168	5.50%	30,376	-0.59%	49,328	2.64%	2,160,725	6.84%	2,327,117	5.59%
2006	768,953	4.32%	413,148	6.83%	962,185	0.52%	30,601	0.74%	53,471	8.40%	2,228,358	3.13%	2,397,793	3.04%
2007	793,914	3.25%	443,914	7.45%	984,671	2.34%	30,773	0.56%	53,953	0.90%	2,307,225	3.54%	2,510,540	4.70%
2008	814,895	2.64%	465,654	4.90%	1,023,079	3.90%	31,081	1.00%	53,706	-0.46%	2,388,415	3.52%	2,596,990	3.44%
2009	846,289	3.85%	490,271	5.29%	991,617	-3.08%	30,433	-2.08%	53,682	-0.04%	2,412,292	1.00%	2,593,368	-0.14%
2010	874,597	3.34%	529,486	8.00%	980,626	-1.11%	30,215	-0.72%	52,262	-2.65%	2,467,186	2.28%	2,718,192	4.81%
2011	946,595	8.23%	606,453	14.54%	977,070	-0.36%	29,776	-1.45%	55,783	6.74%	2,615,677	6.02%	2,776,082	2.13%
2012	957,183	1.12%	679,919	12.11%	948,828	-2.89%	29,802	0.09%	58,464	4.81%	2,674,196	2.24%	2,919,752	5.18%
2013	1,004,937	4.99%	724,520	6.56%	1,173,013	23.63%	29,777	-0.08%	54,115	-7.44%	2,986,362	11.67%	3,223,151	10.39%
2014	1,026,433	2.14%	758,945	4.75%	1,303,314	11.11%	29,777	0.00%	54,375	0.48%	3,172,844	6.24%	3,424,419	6.24%
2015	1,044,572	1.77%	791,508	4.29%	1,381,037	5.96%	29,777	0.00%	54,635	0.48%	3,301,529	4.06%	3,563,307	4.06%
2016	1,060,126	1.49%	823,593	4.05%	1,419,457	2.78%	29,777	0.00%	54,895	0.48%	3,387,848	2.61%	3,656,471	2.61%
2017	1,078,236	1.71%	856,210	3.96%	1,412,919	-0.46%	29,777	0.00%	55,154	0.47%	3,432,296	1.31%	3,704,443	1.31%
2018	1,095,400	1.59%	888,215	3.74%	1,429,252	1.16%	29,777	0.00%	55,415	0.47%	3,498,059	1.92%	3,775,420	1.92%
2019	1,112,281	1.54%	920,618	3.65%	1,445,771	1.16%	29,777	0.00%	55,674	0.47%	3,564,121	1.89%	3,846,720	1.89%
2020	1,125,928	1.23%	952,194	3.43%	1,462,478	1.16%	29,777	0.00%	55,934	0.47%	3,626,311	1.74%	3,913,842	1.74%
2021	1,140,541	1.30%	984,108	3.35%	1,479,389	1.16%	29,777	0.00%	56,195	0.47%	3,690,010	1.76%	3,982,591	1.76%
2022	1,155,008	1.27%	1,015,009	3.14%	1,494,825	1.04%	29,777	0.00%	56,454	0.46%	3,751,073	1.65%	4,048,496	1.65%
2023	1,168,591	1.18%	1,045,600	3.01%	1,510,461	1.05%	29,777	0.00%	56,715	0.46%	3,811,144	1.60%	4,113,330	1.60%
2024	1,180,283	1.00%	1,074,977	2.81%	1,526,297	1.05%	29,777	0.00%	56,974	0.46%	3,868,308	1.50%	4,175,026	1.50%
2025	1,192,908	1.07%	1,104,987	2.79%	1,542,340	1.05%	29,777	0.00%	57,234	0.46%	3,927,246	1.52%	4,238,638	1.52%
2026	1,204,573	0.98%	1,133,553	2.59%	1,558,592	1.05%	29,777	0.00%	57,495	0.46%	3,983,990	1.44%	4,299,881	1.44%
2027	1,215,422	0.90%	1,162,695	2.57%	1,575,043	1.06%	29,777	0.00%	57,754	0.45%	4,040,691	1.42%	4,361,078	1.42%
2028	1,225,517	0.83%	1,189,697	2.32%	1,591,724	1.06%	29,777	0.00%	58,014	0.45%	4,094,729	1.34%	4,419,400	1.34%
2029	1,235,655	0.83%	1,217,144	2.31%	1,608,625	1.06%	29,777	0.00%	58,274	0.45%	4,149,475	1.34%	4,478,487	1.34%
2030	1,245,900	0.83%	1,245,055	2.29%	1,625,749	1.06%	29,777	0.00%	58,534	0.45%	4,205,015	1.34%	4,538,431	1.34%
2031	1,256,273	0.83%	1,273,446	2.28%	1,643,161	1.07%	29,777	0.00%	58,794	0.44%	4,261,451	1.34%	4,599,342	1.34%
2032	1,266,673	0.83%	1,302,327	2.27%	1,660,804	1.07%	29,777	0.00%	59,054	0.44%	4,318,635	1.34%	4,661,060	1.34%
2002-2012 Average Yearly Growth (10 Years History)		3.26%		6.65%		1.02%		-0.29%		1.56%		2.94%		3.06%
2007-2012 Average Yearly Growth (5 Years History)		4.13%		8.95%		-0.95%		-0.84%		1.41%		3.00%		2.90%
2013-2018 Average Yearly Growth (5 Years)		1.74%		4.16%		4.03%		0.00%		0.48%		3.21%		3.21%
2013-2023 Average Yearly Growth (10 Years)		1.52%		3.74%		2.56%		0.00%		0.47%		2.47%		2.47%
2013-2032 Average Yearly Growth (19 Years)		1.23%		3.13%		1.85%		0.00%		0.46%		1.96%		1.96%

Montana-Dakota Integrated System

Historical and Forecasted Sales by Class



Montana-Dakota Utilities Co.
Historical and Forecasted
Residential Sales, Customers, and Use per Customer
Reflecting DSM Reductions

North Dakota							South Dakota							Montana						
Year	Sales (MWh)	% Change	Avg Custs	Cust No Inc/(Dec)	Avg Use Per Cust (kWh/Yr)	% Change	Year	Sales (MWh)	% Change	Avg Custs	Cust No Inc/(Dec)	Avg Use Per Cust (kWh/Yr)	% Change	Year	Sales (MWh)	% Change	Avg Custs	Cust No Inc/(Dec)	Avg Use Per Cust (kWh/Yr)	% Change
2002	510,649		59,608		8,567		2002	61,780		6,768		9,128		2002	147,916		18,635		7,938	
2003	518,363	1.51%	59,953	345	8,646	0.93%	2003	61,149	-1.02%	6,724	(44)	9,094	-0.37%	2003	153,518	3.79%	18,602	(33)	8,253	3.97%
2004	482,828	-6.86%	60,279	326	8,010	-7.36%	2004	56,536	-7.54%	6,681	(43)	8,462	-6.95%	2004	141,249	-7.99%	18,539	(63)	7,619	-7.68%
2005	525,133	8.76%	60,641	362	8,660	8.11%	2005	61,267	8.37%	6,648	(33)	9,216	8.91%	2005	150,706	6.70%	18,502	(37)	8,145	6.91%
2006	550,071	4.75%	61,026	385	9,014	4.09%	2006	61,676	0.67%	6,620	(28)	9,317	1.09%	2006	157,206	4.31%	18,505	3	8,495	4.30%
2007	568,710	3.39%	61,451	425	9,255	2.67%	2007	63,018	2.18%	6,593	(27)	9,558	2.59%	2007	162,186	3.17%	18,531	26	8,752	3.02%
2008	585,609	2.97%	62,068	617	9,435	1.95%	2008	67,104	6.48%	6,612	19	10,149	6.18%	2008	162,182	0.00%	18,582	51	8,728	-0.28%
2009	609,179	4.02%	62,631	563	9,726	3.09%	2009	69,689	3.85%	6,619	7	10,529	3.74%	2009	167,421	3.23%	18,636	54	8,984	2.93%
2010	632,068	3.76%	63,619	988	9,935	2.15%	2010	70,868	1.69%	6,609	(10)	10,723	1.85%	2010	171,661	2.53%	18,716	80	9,172	2.09%
2011	687,465	8.76%	65,196	1,577	10,545	6.13%	2011	73,977	4.39%	6,602	(7)	11,205	4.50%	2011	185,153	7.86%	18,883	167	9,805	6.91%
2012	700,451	1.89%	67,888	2,692	10,318	-2.15%	2012	69,097	-6.60%	6,616	14	10,444	-6.79%	2012	187,635	1.34%	19,191	308	9,777	-0.29%
2013	739,464	5.57%	69,596	1,708	10,625	2.98%	2013	71,459	3.42%	6,622	6	10,791	3.32%	2013	194,014	3.40%	19,633	442	9,882	1.07%
2014	755,457	2.16%	70,796	1,200	10,671	0.43%	2014	72,156	0.98%	6,635	13	10,875	0.78%	2014	198,820	2.48%	20,033	400	9,925	0.44%
2015	769,977	1.92%	71,796	1,000	10,725	0.51%	2015	71,296	-1.19%	6,645	10	10,729	-1.34%	2015	203,299	2.25%	20,383	350	9,974	0.49%
2016	783,547	1.76%	72,696	900	10,778	0.49%	2016	68,742	-3.58%	6,655	10	10,329	-3.73%	2016	207,837	2.23%	20,733	350	10,024	0.50%
2017	797,216	1.74%	73,596	900	10,832	0.50%	2017	69,128	0.56%	6,662	7	10,376	0.46%	2017	211,892	1.95%	21,033	300	10,074	0.50%
2018	809,889	1.59%	74,396	800	10,886	0.50%	2018	69,512	0.56%	6,668	6	10,425	0.47%	2018	215,999	1.94%	21,333	300	10,125	0.51%
2019	822,736	1.59%	75,196	800	10,941	0.51%	2019	69,918	0.58%	6,673	5	10,478	0.51%	2019	219,627	1.68%	21,583	250	10,176	0.50%
2020	834,556	1.44%	75,896	700	10,996	0.50%	2020	68,093	-2.61%	6,676	3	10,200	-2.65%	2020	223,279	1.66%	21,833	250	10,227	0.50%
2021	846,453	1.43%	76,596	700	11,051	0.50%	2021	67,634	-0.67%	6,678	2	10,128	-0.71%	2021	226,454	1.42%	22,033	200	10,278	0.50%
2022	857,313	1.28%	77,196	600	11,106	0.50%	2022	68,035	0.59%	6,680	2	10,185	0.56%	2022	229,660	1.42%	22,233	200	10,330	0.51%
2023	868,317	1.28%	77,796	600	11,161	0.50%	2023	68,429	0.58%	6,680	-	10,244	0.58%	2023	231,845	0.95%	22,333	100	10,381	0.49%
2024	878,263	1.15%	78,296	500	11,217	0.50%	2024	67,980	-0.66%	6,679	(1)	10,178	-0.64%	2024	234,040	0.95%	22,433	100	10,433	0.50%
2025	888,265	1.14%	78,796	500	11,273	0.50%	2025	68,397	0.61%	6,678	(1)	10,242	0.63%	2025	236,246	0.94%	22,533	100	10,484	0.49%
2026	897,266	1.01%	79,196	400	11,330	0.51%	2026	68,821	0.62%	6,677	(1)	10,307	0.63%	2026	238,486	0.95%	22,633	100	10,537	0.51%
2027	906,313	1.01%	79,596	400	11,386	0.49%	2027	68,374	-0.65%	6,675	(2)	10,243	-0.62%	2027	240,735	0.94%	22,733	100	10,590	0.50%
2028	914,257	0.88%	79,896	300	11,443	0.50%	2028	68,798	0.62%	6,674	(1)	10,308	0.63%	2028	242,462	0.72%	22,783	50	10,642	0.49%
2029	922,236	0.87%	80,196	300	11,500	0.50%	2029	69,213	0.60%	6,671	(3)	10,375	0.65%	2029	244,206	0.72%	22,833	50	10,695	0.50%
2030	930,317	0.88%	80,496	300	11,557	0.50%	2030	69,617	0.58%	6,668	(3)	10,440	0.63%	2030	245,966	0.72%	22,883	50	10,749	0.50%
2031	938,481	0.88%	80,796	300	11,615	0.50%	2031	70,049	0.62%	6,666	(2)	10,508	0.65%	2031	247,743	0.72%	22,933	50	10,803	0.50%
2032	946,680	0.87%	81,096	300	11,674	0.51%	2032	70,467	0.60%	6,662	(4)	10,577	0.66%	2032	249,526	0.72%	22,983	50	10,857	0.50%
	Sales		Custs		Use/Cust			Sales		Custs		Use/Cust			Sales		Custs		Use/Cust	
2002-2012 Average Yearly Growth (10 Years History)	3.59%		1.12%		2.44%		2002-2012 Average Yearly Growth (10 Years History)	2.15%		-0.21%		2.36%		2002-2012 Average Yearly Growth (10 Years History)	2.55%		0.23%		2.31%	
2007-2012 Average Yearly Growth (5 Years History)	4.56%		1.91%		2.60%		2007-2012 Average Yearly Growth (5 Years History)	2.22%		0.03%		2.19%		2007-2012 Average Yearly Growth (5 Years History)	3.34%		0.65%		2.67%	
2013-2018 Average Yearly Growth (5 Years)	1.84%		1.34%		0.49%		2013-2018 Average Yearly Growth (5 Years)	-0.55%		0.14%		-0.69%		2013-2018 Average Yearly Growth (5 Years)	2.17%		1.67%		0.49%	
2013-2023 Average Yearly Growth (10 Years)	1.62%		1.12%		0.49%		2013-2023 Average Yearly Growth (10 Years)	-0.43%		0.09%		-0.52%		2013-2023 Average Yearly Growth (10 Years)	1.80%		1.30%		0.49%	
2013-2032 Average Yearly Growth (19 Years)	1.31%		0.81%		0.50%		2013-2032 Average Yearly Growth (19 Years)	-0.07%		0.03%		-0.11%		2013-2032 Average Yearly Growth (19 Years)	1.33%		0.83%		0.50%	

Montana-Dakota Utilities Co.
Historical and Forecasted
Residential Sales, Customers, and Use per Customer
Integrated System
with DSM Reductions

<u>Year</u>	<u>Sales (MWh)</u>	<u>% Change</u>	<u>Avg Custs</u>	<u>Cust No Inc/(Dec)</u>	<u>Avg Use Per Cust (kWh/Yr)</u>	<u>% Change</u>
2002	720,346		85,012		8,473	
2003	733,030	1.76%	85,278	266	8,596	1.44%
2004	680,614	-7.15%	85,498	220	7,961	-7.39%
2005	737,106	8.30%	85,791	293	8,592	7.93%
2006	768,952	4.32%	86,150	359	8,926	3.89%
2007	793,914	3.25%	86,575	425	9,170	2.74%
2008	814,895	2.64%	87,262	687	9,338	1.83%
2009	846,289	3.85%	87,887	625	9,629	3.11%
2010	874,598	3.35%	88,944	1,057	9,833	2.12%
2011	946,595	8.23%	90,681	1,737	10,439	6.16%
2012	957,183	1.12%	93,695	3,014	10,216	-2.13%
2013	1,004,937	4.99%	95,851	2,156	10,484	2.63%
2014	1,026,433	2.14%	97,464	1,613	10,531	0.45%
2015	1,044,572	1.77%	98,824	1,360	10,570	0.37%
2016	1,060,126	1.49%	100,084	1,260	10,592	0.21%
2017	1,078,236	1.71%	101,291	1,207	10,645	0.50%
2018	1,095,400	1.59%	102,397	1,106	10,698	0.49%
2019	1,112,281	1.54%	103,452	1,055	10,752	0.51%
2020	1,125,928	1.23%	104,405	953	10,784	0.30%
2021	1,140,541	1.30%	105,307	902	10,831	0.43%
2022	1,155,008	1.27%	106,109	802	10,885	0.50%
2023	1,168,591	1.18%	106,809	700	10,941	0.51%
2024	1,180,283	1.00%	107,408	599	10,989	0.44%
2025	1,192,908	1.07%	108,007	599	11,045	0.51%
2026	1,204,573	0.98%	108,506	499	11,101	0.51%
2027	1,215,422	0.90%	109,004	498	11,150	0.44%
2028	1,225,517	0.83%	109,353	349	11,207	0.51%
2029	1,235,655	0.83%	109,700	347	11,264	0.51%
2030	1,245,900	0.83%	110,047	347	11,322	0.51%
2031	1,256,273	0.83%	110,395	348	11,380	0.51%
2032	1,266,673	0.83%	110,741	346	11,438	0.51%

	<u>Sales</u>	<u>Custs</u>	<u>Use/Cust</u>
2002-2012 Average Yearly Growth (10 Years History)	3.26%	0.83%	2.41%
2007-2012 Average Yearly Growth (5 Years History)	4.13%	1.50%	2.59%
2013-2018 Average Yearly Growth (5 Years)	1.74%	1.33%	0.40%
2013-2023 Average Yearly Growth (10 Years)	1.52%	1.09%	0.43%
2013-2032 Average Yearly Growth (19 Years)	1.23%	0.76%	0.46%

4. Forecast Uncertainty

Forecasting is a process permeated with uncertainty. The demand and energy projections produced by the econometric process described in the first four sections results in a forecast based solely on the information used as inputs to the equations. For purposes of integrated resource planning, a single forecast does not allow the analysis of risk and uncertainty associated with the input assumptions. Robust resource decisions cannot be made unless uncertainty is considered. That uncertainty can be expressed by peak demand forecasts that reflect temperatures which correspond to higher confidence levels as well as by evaluating high-growth and low-growth scenarios in energy forecasts.

4.1. Effect of Temperature on Peak Demand

The final forecast results given in Section 3 were developed assuming average temperatures at the time of the system peak. However, there are some shortcomings associated with this methodology. First, with an average temperature forecast, by definition actual peak demand would have a 50% probability of being lower than the forecast values and a 50% probability of exceeding forecast values (50/50 forecast). Second, there can be an appearance that peak demand is under forecasted when the actual temperature at the time of system peak exceeds average temperatures.

A study is conducted periodically by Montana-Dakota's System Operations & Planning staff to establish the relationship between summer peak demand and temperature at the time of system peak. As part of the study, the company's historical July and August demands and corresponding temperatures at times when the temperatures equaled or exceeded 85°F on Mondays through Thursdays are analyzed. The 2012 study results indicated that each one degree increase in temperature at the time of summer peak would result in an increase of approximately 6.0 MW in summer peak demand.

Since Montana-Dakota does not have hourly load by state or by customer class, this study is conducted on an Integrated System basis and it is not possible to produce these results by jurisdiction or by customer sector.

Further statistical analysis of temperatures at the time of system peak for the years 1984 through 2011 (prior to 1984 the company was a winter peaking utility) provided the results shown in the following table:

Temperature Probability at Peak and Effect on Peak Demand

<u>Probability</u>	<u>Weighted Average Temperature</u>	<u>Approximate Increase in Peak Demand (MW)</u>
50.0%	96.8	0.0
75.0%	99.6	16.8
80.0%	100.4	21.6
85.0%	101.2	26.4
90.0%	102.2	32.4
95.0%	103.7	41.4
97.0%	104.7	47.4

As the table shows, there is a 90% probability that actual temperatures at the time of the system peak will not exceed 102.2°F. At this temperature, 32.4 MW of capacity in addition to that which was forecasted is needed to meet the system peak demand that may occur. This is called the 90/10 forecast and provides a peak demand forecast for extreme weather conditions. It represents a probability of 90% that the actual peak demand would not exceed the forecast value and a 10% probability that the actual peak demand would be higher than the forecast value.

The following table summarizes the results of the 50/50 probability and 90/10 probability demand forecasts. The 2013 90/10 forecasted demand is calculated to be the 2013 50/50 forecasted demand plus 32.4 MW as shown in the table above. From that point, the growth rate for the 90/10 forecast scenario is assumed to be the same as that of the 50/50 forecast scenario.

Alternate Summer Peak Demand Forecast Comparison

<u>Year</u>	<u>Base Forecast (96.8 degrees F) 50/50 Forecast (MW)</u>	<u>Growth Rate</u>	<u>Alternate Forecast (102.2 degrees F) 90/10 Forecast (MW) */</u>
2013	582.3		614.7
2014	607.0	4.25%	640.8
2015	625.1	2.97%	659.9
2016	637.8	2.04%	673.4
2017	645.7	1.24%	681.7
2018	656.1	1.61%	692.7
2019	666.5	1.58%	703.7
2020	676.5	1.49%	714.2
2021	686.6	1.50%	724.9
2022	696.4	1.43%	735.2
2023	706.0	1.39%	745.4
2024	715.4	1.32%	755.3
2025	724.9	1.33%	765.4
2026	734.2	1.28%	775.2
2027	743.4	1.26%	785.0
2028	752.4	1.20%	794.4
2029	761.4	1.20%	803.9
2030	770.6	1.20%	813.5
2031	779.8	1.20%	823.3
2032	789.1	1.20%	833.2

*/ The growth rate for the 90/10 Forecast scenario is assumed to be the same as that of the 50/50 Forecast scenario.

4.2. High-Growth and Low-Growth Scenario Forecasts

Another approach to express uncertainty in this forecast was to simulate high-growth and low-growth scenarios which represent the corresponding economic conditions that may occur. These high-growth and low-growth scenario forecasts were developed as follows.

Historical total energy was analyzed in order to find a period of time during which unusually high growth was experienced and a period of time during which unusually low growth was experienced. Based on the historical sales data given on Appendix A-10 and graphed on Appendix A-11, the average growth rate that occurred from 1977 to 1985 (4.4%) was used as the basis for the high growth rate and the average growth rate that

occurred from 1985 to 1993 (0.5%) was used as the low growth rate. Both periods consist of eight years of history.

However, as shown on the table on page 26, the growth now projected for the Integrated System in both 2013 and 2014 is greater than 4.4%. It was decided that the high-growth scenario would be set to the growth projected for 2013 and 2014 and growth would then fall to 4.4% per year for 2015 to 2032. Forecasted growth for 2013 and 2014 is fairly well defined and it is unlikely that additional growth opportunities will develop in the near term which will increase the forecasted growth above these levels. For the low-growth scenario, an average growth rate of 0.5% per year was assumed to occur during the 20-year forecast horizon.

Demand for each scenario was derived by applying the load factors calculated from the base forecast to the high-growth and low-growth scenario forecasted energy.

The results of the high-growth and low-growth scenarios for energy and demand are given below. The following two pages present the graphs of the numeric results.

**High-Growth and Low-Growth Scenarios
Total Annual Energy (GWh) and
Summer Peak Demand (MW)**

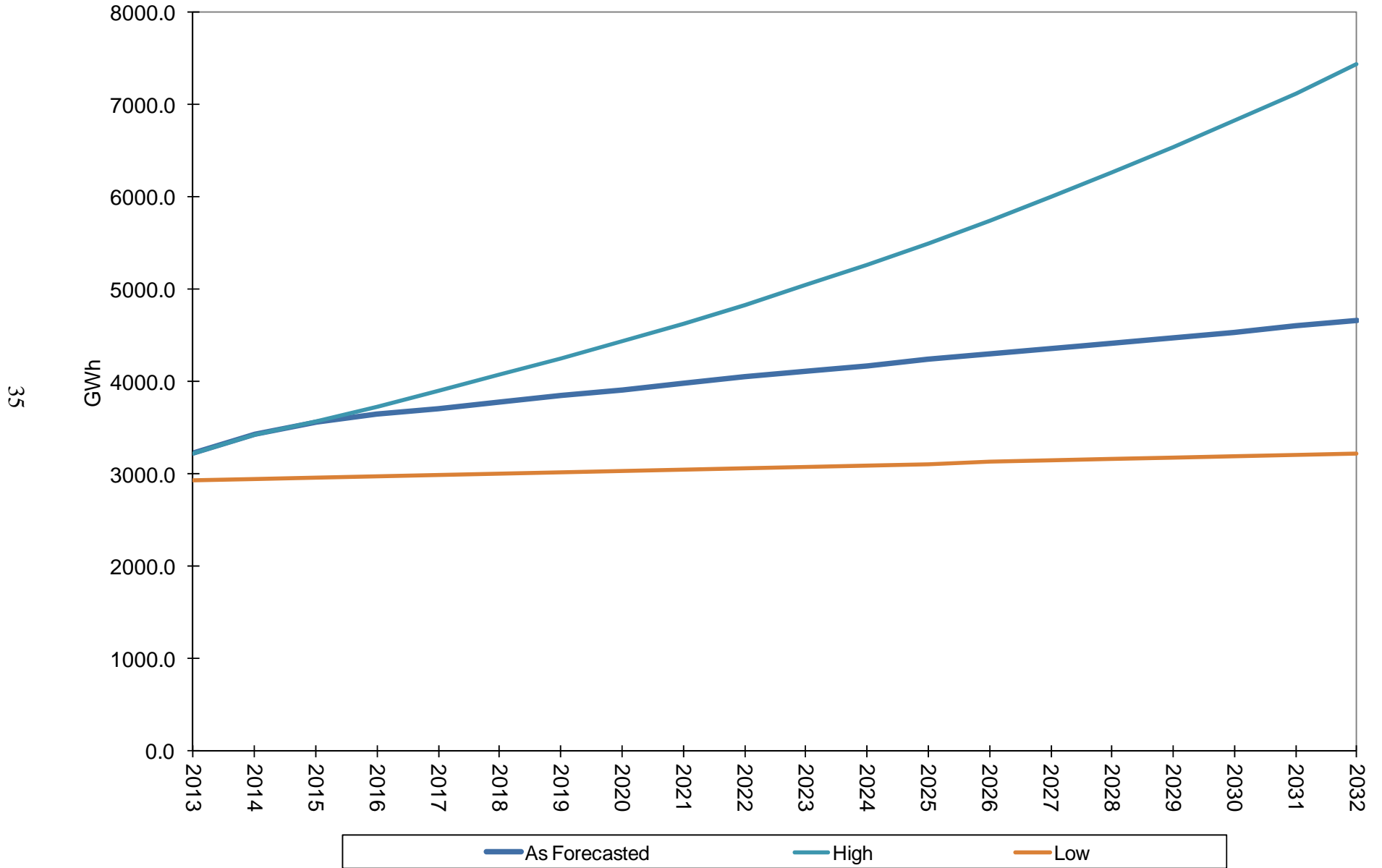
	ENERGY			DEMAND		
	<u>Forecast</u>	<u>HIGH 1/</u>	<u>LOW 2/</u>	<u>Forecast</u>	<u>HIGH</u>	<u>LOW</u>
2013	3229.4	3229.4	2934.4	582.3	582.3	529.1
2014	3428.4	3428.4	2949.1	607.0	607.0	522.1
2015	3566.8	3579.2	2963.8	625.1	627.2	519.4
2016	3658.7	3736.7	2978.6	637.8	651.4	519.3
2017	3707.8	3901.2	2993.5	645.7	679.4	521.3
2018	3778.8	4072.8	3008.5	656.1	707.2	522.4
2019	3849.9	4252.0	3023.5	666.5	736.1	523.4
2020	3917.1	4439.1	3038.7	676.5	766.6	524.8
2021	3985.7	4634.4	3053.8	686.6	798.3	526.1
2022	4051.6	4838.3	3069.1	696.4	831.6	527.5
2023	4116.2	5051.2	3084.5	706.0	866.4	529.1
2024	4178.0	5273.5	3099.9	715.4	903.0	530.8
2025	4241.5	5505.5	3115.4	724.9	940.9	532.4
2026	4302.7	5747.7	3131.0	734.2	980.8	534.2
2027	4363.8	6000.6	3146.6	743.4	1022.3	536.1
2028	4422.1	6264.7	3162.4	752.4	1065.9	538.1
2029	4481.3	6540.3	3178.2	761.4	1111.3	540.0
2030	4541.3	6828.1	3194.1	770.6	1158.6	542.0
2031	4602.2	7128.5	3210.0	779.8	1207.9	543.9
2032	4664.0	7442.2	3226.1	789.1	1259.2	545.8

1/ High forecast assumes no growth greater than that already forecasted for 2013 and 2014 with 4.4% growth per year (actual 77-85 growth) for the remainder of the forecast horizon 2015-2032.

2/ Low forecast assumes 0.5% growth per year (actual 95-93 growth).

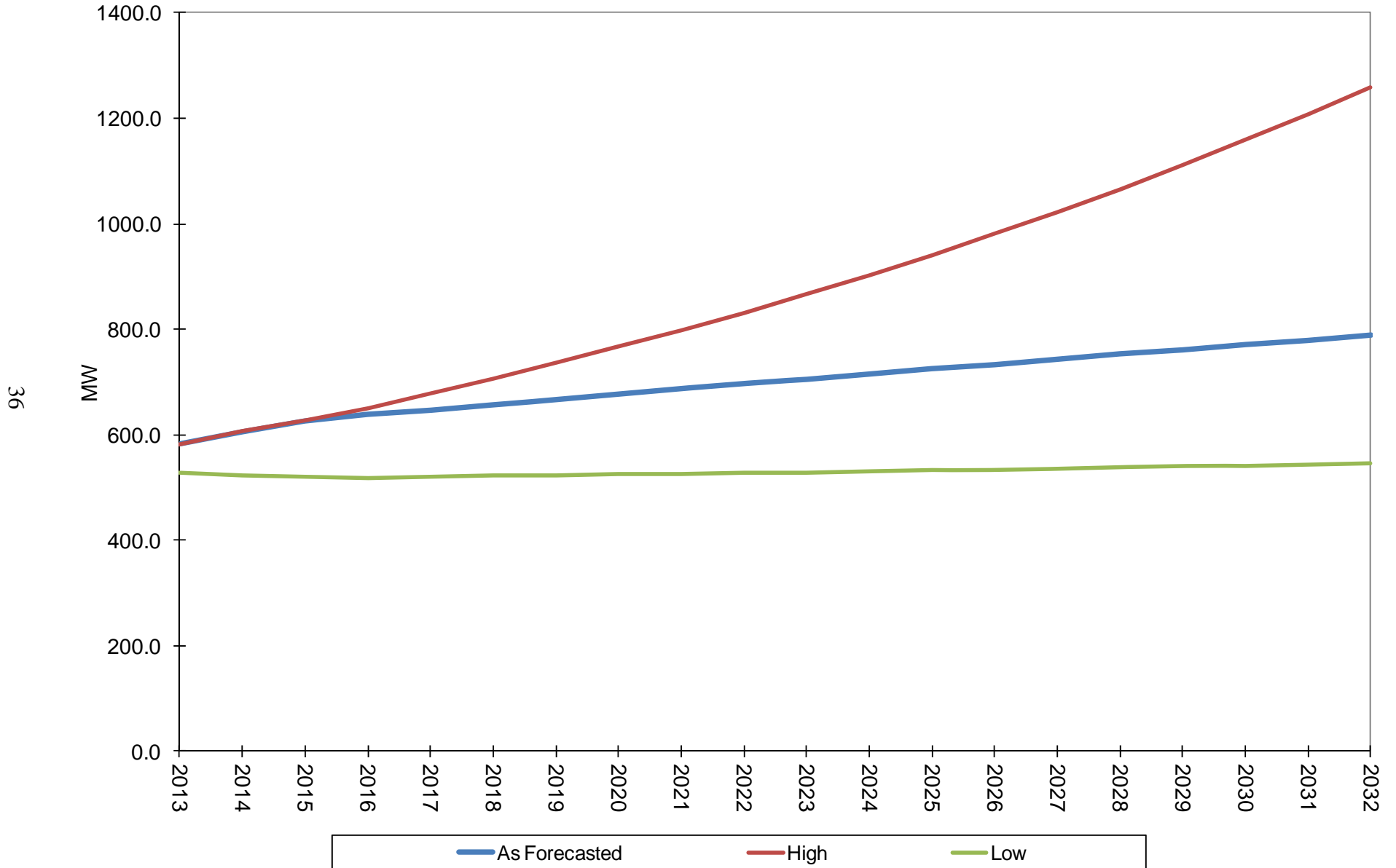
Montana-Dakota Integrated System

High-Growth and Low-Growth Scenarios - Energy in GWh



Montana-Dakota Integrated System

High-Growth and Low-Growth Scenarios - Demand in MW



5. Allocations

Montana-Dakota's Integrated System consists of the service territories in Montana, North Dakota, and South Dakota. The sales forecasts were developed by sector for each state while the demand forecast was developed for the Integrated System in total. Montana-Dakota's Financial Forecasting Department requires forecasts of monthly peak demands by state, and monthly sales and energy requirements by sector for each state. Therefore, disaggregating the Integrated System forecast into peaks by state and month as well as disaggregating annual sales into monthly sales is necessary.

5.1. Sales and Customer Allocations by Month

The Financial Forecasting Department requires a calendar month forecast for each state. This is accomplished through a two-step process. First, monthly estimates of energy and customers by sector are determined by calculating the ratio of the monthly bill cycle value to the annual amount for the 15-year period 1997-2011. Results were averaged for each month for each sector for each state. These ratios were then applied to the forecasts by sector and by state (annual amounts) to arrive at monthly billing-cycle sales. The allocation factors for billing-cycle sales for each state, month and sector are shown in Appendix A-8. Billing-month to calendar-month apportionment factors are then used to convert from billing-month to calendar-month sales. These apportionment factors are shown in Appendix A-9.

5.2. Peak Demand Allocation by State

The forecasted summer and winter peak demand for the Integrated System were allocated to the states based on the percentage of each state's forecasted annual requirements to the total Integrated System forecasted requirements for each year. This methodology permitted the seasonal demand forecasts by state to grow at the same rate as annual energy requirements for each state.

5.3. Peak Demand Allocations by Month

Allocating peak demand on a monthly basis by state consists of several steps:

1. Ratios of each monthly peak to the seasonal peak were calculated for each state for the period May 1997 through April 2012. (The summer season is May through October and the winter season is November through April of the next year.)
2. The ratios determined by state in Step 1 from each month were averaged to determine which month of the season was to be the peak month, second highest month, etc. Final results of this step indicate that July and December are the peak months for the summer and winter seasons, respectively, August and January have the second highest peaks for their respective seasons, etc. (See the table below which gives the monthly ranks by state for each month and season.)

**Monthly Average of the Ratios of Monthly Peak
To Seasonal Peak for the Integrated System
(Number in Parenthesis is Rank)**

**Summer
Season**

	<u>ND</u>	<u>SD</u>	<u>MT</u>
May	(5) 0.6680	(6) 0.6003	(6) 0.6939
June	(3) 0.8804	(3) 0.8476	(3) 0.8892
July	(1) 0.9792	(1) 0.9475	(1) 0.9900
August	(2) 0.9557	(2) 0.9404	(2) 0.9577
September	(4) 0.8100	(4) 0.7719	(4) 0.8309
October	(6) 0.6627	(5) 0.6683	(5) 0.7165

**Winter
Season**

	<u>ND</u>	<u>SD</u>	<u>MT</u>
November	(4) 0.8881	(2) 0.8950	(4) 0.8829
December	(2) 0.9702	(1) 0.9430	(1) 0.9648
January	(1) 0.9738	(4) 0.8693	(2) 0.9519
February	(3) 0.9160	(5) 0.8535	(3) 0.9118
March	(5) 0.8583	(3) 0.8750	(5) 0.8471
April	(6) 0.7914	(6) 0.7708	(6) 0.7537

3. For each season, the monthly ratios determined in Step 1 for the May 1997 through April 2012 time period were sorted into rank sequence for each year of historical data and averaged across the years for each ranking. Applying the ranked average ratios from this step to the proper month according to the rank determined in

Step 2 results in the monthly assignments given in the following table.

**5-Year Average Monthly Ratios of Seasonal Peaks
For North Dakota**

January	0.9512 */	July	1.0000
February	0.9180	August	0.9360
March	0.8380	September	0.7937
April	0.7523	October	0.6385
May	0.7091	November	0.8781
June	0.8907	December	1.0000 */

**5-Year Average Monthly Ratios of Seasonal Peaks
For South Dakota**

January	0.8670	July	1.0000
February	0.8180	August	0.9063
March	0.8886	September	0.7209
April	0.6849	October	0.6694
May	0.5558	November	0.9307
June	0.8260	December	1.0000

**5-Year Average Monthly Ratios of Seasonal Peaks
For Montana**

January	0.9338	July	1.0000
February	0.8941	August	0.9563
March	0.8238	September	0.8320
April	0.7129	October	0.7241
May	0.6639	November	0.8561
June	0.9219	December	1.0000

*/ The January and December ratios for the state of North Dakota as determined in Step 2 above were very close. Since December is typically the peak month, the ratios used here were flipped between January and December, allowing the peak month to continue to be December.

5.4. Annual Energy and Seasonal Peak Demand by State

Historical and forecasted sales by sector and in total are shown on the graphs on Appendices C-1 through C-7.

The forecasts of summer and winter peak demands and annual energy through the year 2032 for the states of Montana, North Dakota, and South

Dakota are also given in Appendix C. The peak demand and annual energy for Montana, North Dakota, South Dakota, and the Integrated System are shown on Appendix C-8, C-9, C-10, and C-11. Appendices C-12, C-13, and C-14 graphically portray the tables in Appendices C-8 through C-11.

5.5. Sales Forecasts by Sector

The monthly forecasts for the ten year period 2013-2022, which result from the allocation method described above, are shown in Appendices D, E, F, and G for Montana, North Dakota, South Dakota, and the Integrated System, respectively.

APPENDIX A

Integrated System Historical Data

Montana-Dakota Utilities Co.
Annual Sales by Class for the State of Montana
(Kilowatt Hours)

<u>Year</u>	<u>Residential</u>	<u>Small C&I</u>	<u>Large C&I</u>	<u>Street Lighting</u>	<u>Other Public Sales</u>	<u>Interdepartmental</u>	<u>Company Use</u>	<u>Unbilled</u>	<u>Total</u>
1966	68,502,477	49,977,929	72,419,095	3,866,284	3,808,210	1,015,211	377,210	-	199,966,416
1967	68,579,218	50,233,896	98,914,908	4,015,663	3,715,582	1,091,354	810,948	-	227,361,569
1968	71,874,276	52,477,560	118,039,208	4,249,304	3,535,121	1,375,297	723,627	-	252,274,393
1969	78,325,684	53,242,727	138,245,825	5,604,625	3,863,692	1,249,804	709,401	-	281,241,758
1970	82,496,690	55,175,717	153,459,061	6,083,320	3,897,568	1,160,863	737,641	-	303,010,860
1971	85,705,748	55,865,479	163,248,877	6,492,393	4,104,508	958,540	960,127	-	317,335,672
1972	90,077,273	58,161,951	172,396,207	6,600,222	3,795,853	992,915	890,585	-	332,915,006
1973	92,338,476	61,367,352	190,984,413	6,706,073	4,211,624	1,158,025	902,676	-	357,668,639
1974	96,505,351	66,904,551	186,287,388	6,840,674	4,153,930	1,315,961	945,082	-	362,952,937
1975	105,048,515	69,452,309	178,400,297	7,087,080	3,913,278	1,506,121	984,351	-	366,391,951
1976	115,110,425	77,612,604	175,313,131	7,268,240	4,495,249	1,583,748	1,004,267	-	382,387,664
1977	120,454,365	81,073,772	172,531,607	7,359,231	4,657,927	1,548,399	1,036,205	-	388,661,506
1978	129,852,166	87,526,266	175,599,086	7,353,808	4,677,788	4,820,487	1,049,471	-	410,879,072
1979	136,672,460	96,589,760	178,879,168	7,359,189	5,467,739	2,283,782	1,029,716	-	428,281,814
1980	136,149,204	101,715,349	198,015,998	7,459,268	6,123,304	1,797,126	972,817	-	452,233,066
1981	144,334,391	111,228,786	206,717,766	7,487,108	6,381,820	1,715,542	752,755	-	478,618,168
1982	153,313,720	125,817,634	213,636,154	7,407,897	5,634,466	2,943,589	1,651,780	-	510,405,240
1983	150,623,962	108,187,279	249,492,431	7,481,435	7,159,425	1,709,185	917,496	-	525,571,213
1984	149,973,668	101,423,250	272,228,601	7,379,668	6,998,461	3,442,266	900,229	-	542,346,143
1985	142,726,940	106,608,809	281,467,351	7,188,874	6,516,453	1,001,594	639,636	-	546,149,657
1986	133,656,316	101,534,376	277,264,926	7,266,290	5,968,032	189,694	590,579	-	526,470,213
1987	126,119,227	95,806,617	248,018,234	7,290,415	6,493,543	195,663	580,473	-	484,504,172
1988	139,327,515	87,777,108	259,622,149	7,217,742	7,711,112	211,260	616,658	-	502,483,544
1989	133,923,369	85,321,774	255,852,368	7,076,958	7,254,814	226,885	599,867	-	490,256,035
1990	130,093,020	84,487,870	253,081,235	7,009,344	7,148,412	226,321	714,125	-	482,760,327
1991	135,844,961	85,054,308	253,947,072	7,232,332	6,944,172	225,952	606,717	-	489,855,514
1992	126,265,220	82,097,610	246,018,931	7,228,554	6,937,275	215,649	560,531	-	469,323,770
1993	131,148,008	85,150,142	239,566,466	7,228,736	6,709,227	223,166	621,957	-	470,647,702
1994	137,293,020	91,734,345	237,573,170	7,257,426	7,110,947	232,838	679,830	-	481,881,576
1995	139,222,942	92,004,117	231,710,303	7,224,945	6,846,494	228,038	621,915	-	477,858,754
1996	147,421,480	96,007,848	231,515,420	7,237,827	7,135,267	233,336	574,831	-	490,126,009
1997	144,515,075	94,430,882	238,928,697	7,237,555	7,244,423	201,302	556,239	-	493,114,173
1998	144,374,643	96,561,060	237,770,443	7,271,601	7,162,112	213,369	549,751	-	493,902,979
1999	139,939,058	93,535,156	251,450,993	7,241,875	7,037,487	201,768	551,485	-	499,957,822
2000	143,298,426	94,947,102	276,845,617	7,212,210	6,819,914	218,795	456,819	-	529,798,883
2001	144,170,040	94,133,492	282,466,554	7,242,218	6,677,075	218,859	453,240	-	535,361,478
2002	147,916,359	96,252,274	306,159,986	7,240,913	6,893,847	195,977	448,893	-	565,108,249
2003	153,518,427	100,463,048	340,070,071	7,208,314	6,991,783	190,115	501,557	-	608,943,315
2004	141,249,319	98,150,615	348,097,119	7,249,849	6,709,211	178,934	469,139	-	602,104,186
2005	150,705,819	102,045,511	364,489,268	7,232,015	6,481,903	194,114	454,825	-	631,603,455
2006	157,205,695	104,213,569	368,666,049	7,202,765	6,996,525	189,666	435,247	-	644,909,516
2007	162,186,142	109,101,052	385,230,122	7,187,164	6,827,828	197,773	430,092	-	671,160,173
2008	162,181,766	108,595,072	408,686,454	7,243,765	7,034,312	190,513	411,809	-	694,343,691
2009	167,420,839	110,379,920	407,647,345	7,244,288	7,149,420	187,117	364,946	-	700,393,875
2010	171,661,490	109,187,916	415,946,482	7,203,307	6,973,614	185,423	351,780	-	711,510,012
2011	185,153,498	119,643,444	427,886,806	7,088,889	7,232,041	192,681	364,683	-	747,562,042
2012	187,634,686	132,714,357	420,458,666	7,106,072	7,603,435	171,842	358,713	-	756,047,771

Montana-Dakota Utilities Co.
Annual Sales by Class for the State of North Dakota
(Kilowatt Hours)

<u>Year</u>	<u>Residential</u>	<u>Small C&I</u>	<u>Large C&I</u>	<u>Street Lighting</u>	<u>Other Public Sales</u>	<u>Interdepartmental</u>	<u>Company Use</u>	<u>Unbilled</u>	<u>Total</u>
1966	177,839,445	101,454,865	62,248,779	12,065,801	9,778,523	242,324	627,634	35,481	364,292,852
1967	178,648,631	101,511,079	66,238,823	12,404,851	10,627,735	235,590	1,496,352	68,626	371,231,687
1968	189,586,695	108,098,127	68,327,053	13,528,733	11,306,057	1,075,808	1,514,551	68,231	393,505,255
1969	203,352,077	117,146,235	69,429,138	14,548,153	11,781,023	3,257,680	1,710,576	66,543	421,291,425
1970	215,129,232	128,966,438	74,006,755	15,405,493	12,432,105	2,976,220	1,632,669	66,670	450,615,582
1971	224,660,134	137,368,067	78,485,841	15,852,055	12,356,099	1,532,592	3,570,747	68,888	473,894,423
1972	241,177,868	141,541,263	85,849,701	16,145,159	12,610,906	230,775	5,480,921	72,184	503,108,777
1973	245,827,613	146,917,105	92,262,004	16,519,767	14,113,173	198,917	5,488,128	71,349	521,398,056
1974	259,763,946	151,905,722	95,263,639	16,812,962	14,147,896	207,547	5,388,873	64,700	543,555,285
1975	284,712,928	174,078,088	107,153,806	17,229,492	14,613,377	194,573	5,283,319	54,272	603,319,855
1976	307,231,757	188,990,076	119,225,930	17,788,799	17,287,746	233,931	5,201,276	58,861	656,018,376
1977	322,066,615	202,204,724	123,518,797	18,705,610	20,388,865	775,960	5,329,555	61,312	693,051,438
1978	360,829,206	226,814,052	131,861,024	19,233,630	22,666,150	448,114	5,583,243	55,953	767,491,372
1979	385,274,877	251,074,945	134,220,720	19,899,710	23,913,957	263,925	5,383,105	56,305	820,087,544
1980	390,283,221	265,468,707	140,987,413	20,492,222	26,160,460	382,762	5,040,756	44,390	848,859,931
1981	408,735,140	273,869,995	175,505,109	21,076,949	24,329,774	244,375	4,212,597	46,134	908,020,073
1982	452,363,924	254,889,852	236,334,289	21,499,821	26,288,435	261,436	4,964,613	47,986	987,650,356
1983	456,184,125	258,134,530	230,553,333	21,370,120	28,270,730	382,443	8,659,379	41,916	1,003,596,576
1984	455,285,616	267,515,911	240,737,178	20,966,383	28,884,506	2,020,361	6,602,362	42,325	1,022,054,642
1985	450,793,794	284,254,986	233,446,499	20,793,870	28,421,516	194,570	6,810,757	39,484	1,024,755,476
1986	434,367,094	282,091,350	232,968,286	20,399,709	29,251,485	283,486	8,387,924	37,451	1,007,786,785
1987	414,769,777	226,151,695	289,829,031	20,488,538	27,652,568	306,718	6,531,047	46,880	985,776,254
1988	449,769,976	199,876,624	348,910,521	20,488,320	27,128,548	233,035	6,339,307	34,969	1,052,781,300
1989	443,827,623	195,738,987	362,960,433	20,407,635	26,027,847	236,202	6,825,024	38,865	1,056,062,616
1990	430,825,093	192,983,257	373,076,254	20,510,585	25,648,820	243,363	6,283,396	37,303	1,049,608,071
1991	450,333,411	196,030,842	383,766,958	20,458,655	30,828,407	266,645	6,137,808	33,378	1,087,856,104
1992	423,260,909	188,693,144	398,197,743	20,663,341	31,720,268	282,076	6,211,805	48,627	1,069,077,913
1993	439,344,573	191,672,169	416,752,959	20,565,116	31,146,204	322,281	5,956,790	46,519	1,105,806,611
1994	456,342,312	203,783,580	445,849,305	20,574,807	32,828,420	316,899	6,987,912	41,960	1,166,725,195
1995	473,310,757	207,631,769	447,406,363	20,664,316	32,139,766	311,888	7,116,061	43,365	1,188,624,285
1996	489,581,963	212,394,753	463,633,627	20,598,257	33,617,666	293,678	7,112,634	42,287	1,227,274,865
1997	485,185,916	215,341,328	464,356,987	20,448,097	35,525,187	276,970	7,039,295	37,836	1,228,211,616
1998	476,555,259	216,137,378	470,352,073	20,780,506	33,387,706	268,955	6,460,961	35,675	1,223,978,513
1999	476,150,870	215,933,149	487,339,322	20,930,538	32,535,686	269,387	6,214,785	24,378	1,239,398,115
2000	480,611,397	220,082,001	496,752,971	20,765,723	32,298,343	276,507	5,758,461	-	1,256,545,403
2001	495,264,092	219,718,551	524,934,913	20,801,786	32,839,971	283,411	5,380,094	-	1,299,222,818
2002	510,649,026	223,725,158	534,095,959	20,845,828	33,601,388	245,882	4,924,187	-	1,328,087,428
2003	518,362,506	230,831,463	538,714,606	20,964,805	33,818,825	243,012	5,146,364	-	1,348,081,581
2004	482,828,358	224,924,291	532,079,391	20,632,572	32,251,096	238,077	5,030,082	-	1,297,983,867
2005	525,132,818	250,022,338	563,792,863	20,484,092	33,806,432	248,541	5,291,349	-	1,398,778,433
2006	550,070,624	274,727,542	564,963,429	20,772,430	35,894,619	238,213	7,203,891	-	1,453,870,748
2007	568,709,867	299,602,230	570,170,485	20,947,764	36,072,776	235,341	7,511,339	-	1,503,249,802
2008	585,608,722	320,093,226	583,501,829	21,200,739	35,709,163	242,421	7,356,084	-	1,553,712,184
2009	609,178,728	340,495,770	551,113,741	20,582,112	36,202,033	237,223	7,494,346	-	1,565,303,953
2010	632,068,296	382,985,447	530,340,771	20,372,584	35,746,426	237,329	7,232,018	-	1,608,982,871
2011	687,464,765	450,098,381	514,238,222	20,059,394	38,643,539	230,042	7,390,957	-	1,718,125,300
2012	700,451,260	512,566,297	492,981,290	20,075,686	40,771,733	202,097	7,544,693	-	1,774,593,056

Montana-Dakota Utilities Co.
Annual Sales by Class for the State of South Dakota
(Kilowatt Hours)

<u>Year</u>	<u>Residential</u>	<u>Small C&I</u>	<u>Large C&I</u>	<u>Street Lighting</u>	<u>Other Public Sales</u>	<u>Interdepartmental</u>	<u>Company Use</u>	<u>Unbilled</u>	<u>Total</u>
1966	42,230,739	22,427,449	6,732,280	2,095,903	1,697,150	1,424	126,325	-	75,311,270
1967	41,997,237	25,800,957	4,063,750	1,979,052	1,847,881	1,153	260,654	-	75,950,684
1968	43,952,926	23,284,225	3,940,603	2,575,843	1,707,100	1,608	268,857	-	75,731,162
1969	46,482,606	24,758,227	929,501	2,598,403	1,841,636	2,207	287,654	-	76,900,234
1970	47,361,709	22,775,007	3,464,385	2,547,642	1,759,567	2,154	269,189	-	78,179,653
1971	49,310,679	22,255,017	4,727,415	2,716,302	1,834,084	2,362	315,769	215	81,161,843
1972	52,980,235	22,785,758	5,347,104	2,813,232	1,918,580	2,270	365,122	-	86,212,301
1973	53,570,804	23,259,175	5,400,790	2,859,812	1,987,540	2,559	432,365	-	87,513,045
1974	56,666,860	23,203,748	5,840,707	2,994,179	2,138,696	2,487	428,561	-	91,275,238
1975	62,824,496	24,817,191	6,748,459	3,128,822	2,030,891	2,433	480,797	-	100,033,089
1976	66,343,302	25,800,602	7,756,873	3,103,016	2,053,227	2,370	467,531	-	105,526,921
1977	65,963,975	26,111,838	8,474,190	3,124,296	1,840,714	3,151	478,536	-	105,996,700
1978	68,589,710	27,328,956	9,693,110	3,113,948	1,774,321	2,966	607,731	-	111,110,742
1979	67,938,559	26,971,950	10,123,460	3,121,871	1,904,825	2,983	620,674	-	110,684,322
1980	64,325,468	26,196,596	10,851,108	3,140,131	2,170,017	3,737	507,507	-	107,194,564
1981	61,878,613	25,902,182	11,243,318	3,083,603	1,830,577	2,970	356,399	-	104,297,662
1982	65,558,005	27,156,570	11,426,316	3,030,031	1,871,552	2,943	607,247	-	109,652,664
1983	65,118,829	26,884,079	12,353,692	3,006,759	1,716,506	2,486	557,667	-	109,640,018
1984	65,920,772	27,933,476	12,698,954	2,964,197	1,816,219	1,782	545,965	-	111,881,365
1985	64,222,969	27,289,287	13,297,147	2,968,984	1,826,822	7,425	829,238	-	110,441,872
1986	62,444,941	27,005,631	14,820,308	2,987,404	1,637,375	22,258	571,879	-	109,489,796
1987	59,644,668	26,773,933	16,227,633	2,986,179	1,857,719	28,687	363,754	-	107,882,573
1988	63,622,038	28,168,260	18,064,220	2,953,900	1,925,245	14,449	419,470	-	115,167,582
1989	61,747,940	28,578,702	19,249,467	2,937,751	2,019,854	13,359	456,236	-	115,003,309
1990	59,041,129	27,674,002	20,540,349	2,938,991	1,879,111	9,908	369,286	-	112,452,776
1991	60,709,134	28,371,913	20,800,179	2,944,664	2,119,069	10,945	398,192	-	115,354,096
1992	56,416,333	27,113,531	21,125,368	2,920,263	2,354,085	10,701	343,584	-	110,283,865
1993	59,615,263	27,986,509	22,314,105	2,921,246	2,116,180	11,786	397,837	-	115,362,926
1994	61,124,471	30,267,538	23,784,346	2,922,998	2,427,771	11,901	422,267	-	120,961,292
1995	62,959,707	31,134,415	24,670,253	2,854,516	3,097,276	11,484	404,093	-	125,131,744
1996	63,638,266	32,141,951	25,352,355	2,872,136	3,137,175	12,172	352,311	-	127,506,366
1997	61,623,748	31,753,237	25,522,619	2,805,901	3,058,443	11,319	342,786	-	125,118,053
1998	59,360,287	32,313,292	25,113,488	2,796,107	3,003,078	9,777	286,457	-	122,882,486
1999	59,567,949	32,498,800	25,977,705	2,807,423	2,954,190	9,857	297,480	-	124,113,404
2000	59,525,312	32,320,913	25,956,274	2,740,106	2,810,931	9,227	308,855	-	123,671,618
2001	61,117,630	33,018,447	25,846,819	2,748,375	2,742,790	9,414	325,833	-	125,809,308
2002	61,780,443	33,800,702	26,645,097	2,691,584	2,737,670	9,884	329,617	-	127,994,997
2003	61,149,061	33,964,499	27,075,451	2,683,876	2,791,070	10,319	319,687	-	127,993,963
2004	56,535,958	32,909,312	27,090,632	2,672,475	2,885,412	9,788	290,260	-	122,393,837
2005	61,267,370	34,678,560	28,886,389	2,660,320	2,535,633	10,026	305,636	-	130,343,934
2006	61,675,574	34,206,361	28,556,470	2,626,482	2,204,422	9,086	299,875	-	129,578,270
2007	63,017,590	35,210,997	29,271,378	2,637,764	2,364,117	9,526	304,850	-	132,816,222
2008	67,104,019	36,965,622	30,890,745	2,635,828	2,432,011	9,826	318,928	-	140,356,979
2009	69,689,062	39,395,377	32,856,198	2,606,502	1,701,927	9,019	335,872	-	146,593,957
2010	70,867,723	37,312,865	34,338,981	2,638,638	1,210,011	8,876	316,402	-	146,693,496
2011	73,976,689	36,711,846	34,944,961	2,627,500	1,383,960	7,798	337,074	-	149,989,828
2012	69,097,067	34,638,566	35,388,342	2,620,423	1,518,467	2,742	289,333	-	143,554,940

Montana-Dakota Utilities Co.
Annual Sales by Class for the Integrated System
(Kilowatt Hours)

<u>Year</u>	<u>Residential</u>	<u>Small C&I</u>	<u>Large C&I</u>	<u>Street Lighting</u>	<u>Other Public Sales</u>	<u>Interdepartmental</u>	<u>Company Use</u>	<u>Unbilled</u>	<u>Total</u>
1966	288,572,661	173,860,243	141,400,154	18,027,988	15,283,883	1,258,959	1,131,169	35,481	639,570,538
1967	289,225,086	177,545,932	169,217,481	18,399,566	16,191,198	1,328,097	2,567,954	68,626	674,543,940
1968	305,413,897	183,859,912	190,306,864	20,353,880	16,548,278	2,452,713	2,507,035	68,231	721,510,810
1969	328,160,367	195,147,189	208,604,464	22,751,181	17,486,351	4,509,691	2,707,631	66,543	779,433,417
1970	344,987,631	206,917,162	230,930,201	24,036,455	18,089,240	4,139,237	2,639,499	66,670	831,806,095
1971	359,676,561	215,488,563	246,462,133	25,060,750	18,294,691	2,493,494	4,846,643	69,103	872,391,938
1972	384,235,376	222,488,972	263,593,012	25,558,613	18,325,339	1,225,960	6,736,628	72,184	922,236,084
1973	391,736,893	231,543,632	288,647,207	26,085,652	20,312,337	1,359,501	6,823,169	71,349	966,579,740
1974	412,936,157	242,014,021	287,391,734	26,647,815	20,440,522	1,525,995	6,762,516	64,700	997,783,460
1975	452,585,939	268,347,588	292,302,562	27,445,394	20,557,546	1,703,127	6,748,467	54,272	1,069,744,895
1976	488,685,484	292,403,282	302,295,934	28,160,055	23,836,222	1,820,049	6,673,074	58,861	1,143,932,961
1977	508,484,955	309,390,334	304,524,594	29,189,137	26,887,506	2,327,510	6,844,296	61,312	1,187,709,644
1978	559,271,082	341,669,274	317,153,220	29,701,386	29,118,259	5,271,567	7,240,445	55,953	1,289,481,186
1979	589,885,896	374,636,655	323,223,348	30,380,770	31,286,521	2,550,690	7,033,495	56,305	1,359,053,680
1980	590,757,893	393,380,652	349,854,519	31,091,621	34,453,781	2,183,625	6,521,080	44,390	1,408,287,561
1981	614,948,144	411,000,963	393,466,193	31,647,660	32,542,171	1,962,887	5,321,751	46,134	1,490,935,903
1982	671,235,649	398,864,056	461,396,759	31,937,749	33,794,453	3,207,968	7,223,640	47,986	1,607,708,260
1983	671,926,916	393,205,888	492,399,456	31,858,314	37,146,661	2,094,114	10,134,542	41,916	1,638,807,807
1984	671,180,056	396,872,637	525,664,733	31,310,248	37,699,186	5,464,409	8,048,556	42,325	1,676,282,150
1985	657,743,703	418,153,082	528,210,997	30,951,728	36,764,791	1,203,589	8,279,631	39,484	1,681,347,005
1986	630,468,351	410,631,357	525,053,520	30,653,403	36,856,892	495,438	9,550,382	37,451	1,643,746,794
1987	600,533,672	348,732,245	554,074,898	30,765,132	36,003,830	531,068	7,475,274	46,880	1,578,162,999
1988	652,719,529	315,821,992	626,596,890	30,659,962	36,764,905	458,744	7,375,435	34,969	1,670,432,426
1989	639,498,932	309,639,463	638,062,268	30,422,344	35,302,515	476,446	7,881,127	38,865	1,661,321,960
1990	619,959,242	305,145,129	646,697,838	30,458,920	34,676,343	479,592	7,366,807	37,303	1,644,821,174
1991	646,887,506	309,457,063	658,514,209	30,635,651	39,891,648	503,542	7,142,717	33,378	1,693,065,714
1992	605,942,462	297,904,285	665,342,042	30,812,158	41,011,628	508,426	7,115,920	48,627	1,648,685,548
1993	630,107,844	304,808,820	678,633,530	30,715,098	39,971,611	557,233	6,976,584	46,519	1,691,817,239
1994	654,759,803	325,785,463	707,206,821	30,755,231	42,367,138	561,638	8,090,009	41,960	1,769,568,063
1995	675,493,406	330,770,301	703,786,919	30,743,777	42,083,536	551,410	8,142,069	43,365	1,791,614,783
1996	700,641,709	340,544,552	720,501,402	30,708,220	43,890,108	539,186	8,039,776	42,287	1,844,907,240
1997	691,324,739	341,525,447	728,808,303	30,491,553	45,828,053	489,591	7,938,320	37,836	1,846,443,842
1998	680,290,189	345,011,730	733,236,004	30,848,214	43,552,896	492,101	7,297,169	35,675	1,840,763,978
1999	675,657,877	341,967,105	764,768,020	30,979,836	42,527,363	481,012	7,063,750	24,378	1,863,469,341
2000	683,435,135	347,350,016	799,554,862	30,718,039	41,929,188	504,529	6,524,135	-	1,910,015,904
2001	700,551,762	346,870,490	833,248,286	30,792,379	42,259,836	511,684	6,159,167	-	1,960,393,604
2002	720,345,828	353,778,134	866,901,042	30,778,325	43,232,905	451,743	5,702,697	-	2,021,190,674
2003	733,029,994	365,259,010	905,860,128	30,856,995	43,601,678	443,446	5,967,608	-	2,085,018,859
2004	680,613,635	355,984,218	907,267,142	30,554,896	41,845,719	426,799	5,789,481	-	2,022,481,890
2005	737,106,007	386,746,409	957,168,520	30,376,427	42,823,968	452,681	6,051,810	-	2,160,725,822
2006	768,951,893	413,147,472	962,185,948	30,601,677	45,095,566	436,965	7,939,013	-	2,228,358,534
2007	793,913,599	443,914,279	984,671,985	30,772,692	45,264,721	442,640	8,246,281	-	2,307,226,197
2008	814,894,507	465,653,920	1,023,079,028	31,080,332	45,175,486	442,760	8,086,821	-	2,388,412,854
2009	846,288,629	490,271,067	991,617,284	30,432,902	45,053,380	433,359	8,195,164	-	2,412,291,785
2010	874,597,509	529,486,228	980,626,234	30,214,529	43,930,051	431,628	7,900,200	-	2,467,186,379
2011	946,594,952	606,453,671	977,069,989	29,775,783	47,259,540	430,521	8,092,714	-	2,615,677,170
2012	957,183,013	679,919,220	948,828,298	29,802,181	49,893,635	376,681	8,192,739	-	2,674,195,767

Montana-Dakota Utilities Co.
Integrated System Seasonal Peaks and Peak Month Load Factors 1/
1960 through 2012

Year	SUMMER			WINTER			Annual load Factor
	MW	Month	Load Factor	MW	Month	Load Factor	
1960	76.7	AUG	70.7	109.3	DEC	58.8	50.9
1961	82.8	AUG	73.7	113.7	JAN	62.0	52.5
1962	83.8	AUG	76.4	123.2	JAN	65.4	53.7
1963	95.9	JUL	68.9	127.6	DEC	63.3	52.5
1964	101.8	AUG	68.2	138.2	DEC	64.2	51.8
1965	108.4	AUG	68.7	138.0	JAN	68.5	56.5
1966	114.0	JUL	70.5	149.6	JAN	65.4	58.2
1967	129.0	JUL	71.3	161.8	JAN	68.1	60.0
1968	133.3	JUL	69.9	173.5	DEC	65.1	55.0
1969	153.4	AUG	70.0	178.2	JAN	70.3	62.0
1970	160.5	JUL	70.2	186.2	DEC	67.6	59.5
1971	170.9	AUG	72.2	195.7	JAN	70.5	58.2
1972	174.5	AUG	72.6	209.1	DEC	69.4	58.5
1973	199.6	AUG	69.9	200.1	DEC	67.3	63.2
1974	210.0	JUL	71.9	222.0	JAN	66.6	62.7
1975	230.8	JUL	68.3	238.2	JAN	67.8	59.5
1976	242.6	AUG	64.8	241.3	JAN	78.1	59.7
1977	253.7	JUL	61.2	257.8	DEC	71.3	57.9
1978	257.2	SEP	59.9	268.1	JAN	79.0	62.9
1979	257.6	JUL	65.0	287.5	JAN	73.7	63.1
1980	291.2	JUL	64.4	292.0	DEC	73.4	61.7
1981	315.4	JUL	61.6	333.4	JAN	75.2	59.0
1982	322.7	AUG	60.8	293.7	DEC	74.9	59.6
1983	337.5	AUG	68.5	354.1	DEC	72.7	57.5
1984	354.6	AUG	64.3	330.6	JAN	74.3	58.3
1985	350.4	JUL	62.7	324.2	DEC	74.2	59.8
1986	338.0	JUN	57.9	293.2	DEC	73.4	59.2
1987	358.6	JUL	58.7	306.2	FEB	76.2	54.6
1988	386.7	JUN	61.6	320.9	FEB	74.1	54.2
1989	383.6	AUG	57.1	341.6	DEC	69.8	54.4
1990	381.6	JUL	55.4	330.2	DEC	70.8	53.5
1991	387.1	JUL	58.0	311.8	DEC	74.3	54.2
1992	339.1	AUG	60.9	337.5	DEC	73.1	61.4
1993	350.3	AUG	62.3	332.7	JAN	77.5	61.0
1994	369.8	AUG	61.8	322.6	DEC	74.5	59.7
1995	412.7	AUG	59.8	348.7	FEB	68.6	54.0
1996	393.3	AUG	62.6	343.1	JAN	78.4	58.3
1997	404.6	JUL	61.6	332.8	JAN	74.4	56.6
1998	402.5	AUG	63.6	354.2	DEC	70.1	56.9
1999	420.6	JUL	61.3	342.4	DEC	70.7	54.2
2000	432.3	AUG	61.3	353.9	DEC	77.4	54.9
2001	452.9	AUG	62.3	328.9	DEC	78.2	53.0
2002	458.8	JUL	64.9	343.5	JAN	78.4	53.7
2003	470.5	AUG	64.3	367.7	JAN	77.2	54.0
2004	458.4	JUL	60.4	383.4	JAN	76.7	54.9
2005	459.1	JUL	65.9	387.2	DEC	76.8	57.9
2006	485.5	JUL	68.3	397.2	NOV	69.3	56.4
2007	525.6	JUL	66.3	407.3	JAN	80.5	54.5
2008	476.6	AUG	66.9	455.0	DEC	78.1	62.2
2009	473.8	AUG	61.2	459.6	DEC	78.4	62.5
2010	502.5	AUG	64.8	457.8	JAN	79.8	61.7
2011	535.8	JUL	63.2	510.8	JAN	71.6	59.2
2012	573.6	JUL	66.8				

1/ MDU only net peak on combined system as calculated by MDU (excludes REC adjusted peak).

2/ January and February is of the following year.

3/ Ratio of winter peak to preceding summer peak.

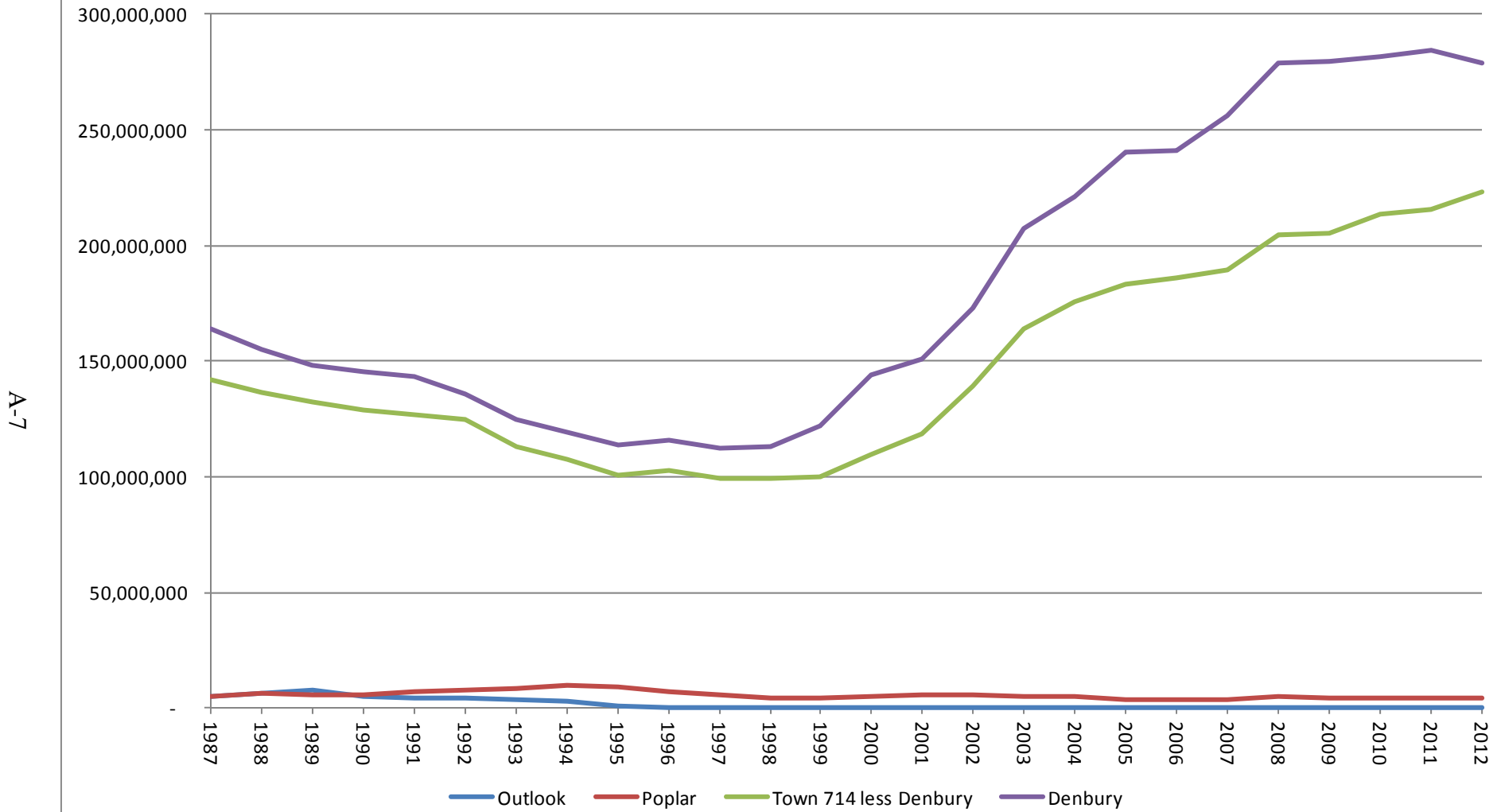
Montana-Dakota Utilities Co.
Demand by State at Time of System Seasonal Peak
(Megawatts)

<u>Year</u>	<u>SUMMER</u>				<u>WINTER</u>			
	<u>ND</u>	<u>SD</u>	<u>MT</u>	<u>Int Sys</u>	<u>ND</u>	<u>SD</u>	<u>MT</u>	<u>Int Sys</u>
1975	139.4	22.1	69.3	230.8	145.1	22.8	70.3	238.2 *
1976	147.4	24.2	71.0	242.6	147.3	24.1	69.9	241.3 *
1977	155.9	23.5	74.6	254.0	155.1	24.3	78.4	257.8
1978	165.5	20.4	70.3	256.2	165.5	23.9	78.7	268.1 *
1979	166.4	16.4	74.8	257.6	177.2	24.1	86.2	287.5 *
1980	181.5	21.5	88.2	291.2	180.8	21.8	89.4	292.0
1981	202.3	21.0	92.1	315.4	201.5	24.9	106.9	333.3 *
1982	208.0	20.8	93.9	322.7	185.0	21.1	87.6	293.7
1983	221.2	20.9	95.4	337.5	225.7	27.5	100.9	354.1
1984	234.8	23.9	96.0	354.7	209.4	23.0	98.2	330.6 *
1985	233.3	24.4	92.7	350.4	206.9	22.4	94.9	324.2
1986	224.2	22.5	91.4	338.1	196.4	21.2	75.7	293.3
1987	242.1	28.5	88.1	358.7	204.6	22.8	78.8	306.2 *
1988	265.6	28.4	92.7	386.7	212.1	23.7	85.0	320.8 *
1989	265.1	27.6	90.9	383.6	225.6	26.9	89.1	341.6
1990	261.2	26.2	94.2	381.6	218.2	24.1	87.9	330.2
1991	271.9	30.0	85.2	387.1	217.5	19.9	74.4	311.8
1992	234.4	20.9	83.7	339.0	233.4	23.9	80.1	337.4
1993	251.1	23.3	75.9	350.3	225.6	25.5	81.6	332.7 *
1994	253.7	27.9	88.2	369.8	220.9	24.5	77.2	322.6
1995	290.6	27.1	95.0	412.7	236.1	22.5	90.1	348.7 *
1996	272.0	27.1	94.1	393.2	233.6	21.3	88.2	343.1 *
1997	288.0	22.4	94.3	404.7	225.0	20.0	87.8	332.8 *
1998	285.1	25.7	91.7	402.5	248.2	21.6	84.4	354.2
1999	295.0	28.7	96.9	420.6	237.3	21.6	83.6	342.5
2000	302.9	30.1	99.3	432.3	234.7	22.8	96.4	353.9
2001	317.8	29.8	105.4	453.0	235.0	14.3	79.6	328.9
2002	326.0	26.4	106.4	458.8	242.9	14.4	86.2	343.5 *
2003	328.4	28.4	113.7	470.5	251.4	19.4	96.9	367.7 *
2004	320.2	28.4	109.8	458.4	258.8	21.9	102.7	383.4 *
2005	311.6	27.7	119.8	459.1	265.0	21.8	100.4	387.2
2006	346.3	29.0	110.1	485.4	272.0	23.8	101.4	397.2
2007	365.8	31.6	128.3	525.7	293.0	25.3	89.0	407.3 *
2008	330.1	27.6	118.9	476.6	309.1	30.3	115.6	455.0
2009	337.0	27.7	109.0	473.7	313.3	28.8	117.5	459.6
2010	357.7	28.4	116.4	502.5	330.1	25.7	102.0	457.8 *
2011	385.3	32.6	117.9	535.8	366.4	29.9	114.5	510.8 *
2012	406.8	24.9	141.9	573.6				

* Winter peak is in the following year.

Montana-Dakota Utilities Co.

Montana Oil Field LC&I Energy



**Montana-Dakota Utilities Co.
Billing Cycle Allocation Factors by State**

North Dakota

<u>Sales</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Residential	0.109992	0.091644	0.090054	0.075878	0.065782	0.067642	0.085894	0.098756	0.080181	0.069012	0.071920	0.093246
Small C&I	0.095702	0.085379	0.086673	0.075941	0.071704	0.074439	0.084759	0.093762	0.085385	0.077493	0.078165	0.090597
Large C&I	0.089154	0.080930	0.081905	0.079382	0.076074	0.081143	0.089095	0.093456	0.086902	0.083200	0.076715	0.082043
Street Lighting	0.095016	0.087480	0.085900	0.081633	0.078442	0.076526	0.075260	0.078252	0.080044	0.084095	0.086044	0.091308
Other Public Sales	0.083987	0.076479	0.083101	0.071313	0.077469	0.086360	0.099454	0.105979	0.091348	0.077636	0.069386	0.077487
Interdepartmental	0.107498	0.092012	0.093039	0.085832	0.078283	0.074119	0.073537	0.074281	0.072310	0.076777	0.078161	0.094152
Company Use	0.090441	0.080684	0.080434	0.079963	0.077408	0.085718	0.088849	0.096436	0.085491	0.077085	0.077632	0.079858
Tesoro Refinery	0.082516	0.066701	0.082270	0.084979	0.075568	0.088138	0.089465	0.093307	0.090884	0.087938	0.077937	0.080296
Westmoreland Coal	0.106536	0.098014	0.092387	0.088278	0.074914	0.073285	0.069760	0.069954	0.072069	0.078149	0.081588	0.095066
<u>Customers</u>												
Residential	0.996070	0.996496	0.996829	0.996925	0.998006	0.999374	1.000397	1.001675	1.002247	1.003307	1.004143	1.004530
Small C&I	0.986078	0.985568	0.986163	0.992789	1.001085	1.006727	1.007641	1.011046	1.010592	1.005163	1.003004	1.004144
Large C&I	0.998651	1.000923	1.002249	1.006036	1.007266	1.006509	1.006888	0.993917	0.993538	0.995432	0.994580	0.994012
Street Lighting	1.009145	1.003658	1.001663	1.003824	1.004822	1.007815	0.986531	0.991021	0.993016	0.996674	0.998836	1.002993
Other Public Sales	0.994842	0.994842	0.996164	1.001670	1.008168	1.008499	1.007838	1.006516	1.003653	0.998256	0.991979	0.987573
Peak Demand	0.9512	0.9180	0.8380	0.7523	0.7091	0.8907	1.0000	0.9360	0.7937	0.6385	0.8781	1.0000

South Dakota

<u>Sales</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Residential	0.112516	0.094206	0.093594	0.078905	0.067021	0.066401	0.082257	0.096570	0.077844	0.066591	0.071643	0.092453
Small C&I	0.100183	0.087435	0.088062	0.076889	0.069137	0.071969	0.084836	0.098773	0.085021	0.074021	0.073958	0.089716
Large C&I	0.088190	0.078719	0.081702	0.076496	0.076714	0.076801	0.080966	0.094279	0.086481	0.087096	0.083646	0.088909
Street Lighting	0.084776	0.083175	0.083857	0.083317	0.082994	0.082812	0.082728	0.082819	0.082974	0.083592	0.083050	0.083907
Other Public Sales	0.086059	0.074006	0.077887	0.075538	0.073537	0.090825	0.104198	0.110927	0.084996	0.084160	0.066674	0.071192
Interdepartmental	0.152203	0.117683	0.106448	0.070933	0.056859	0.051975	0.051064	0.055273	0.060031	0.063691	0.089779	0.124063
Company Use	0.168018	0.161749	0.149244	0.094195	0.052687	0.060840	0.019583	0.047980	0.041076	0.037375	0.059029	0.108224
<u>Customers</u>												
Residential	0.997011	0.996456	0.996179	0.997170	0.999914	1.002104	1.005928	1.005522	1.004184	1.001747	0.998230	0.995555
Small C&I	0.978357	0.976828	0.978021	0.991630	1.012620	1.021457	1.022277	1.020226	1.015790	0.999870	0.992152	0.990772
Large C&I	0.977316	0.977316	0.975425	0.998110	1.003781	1.003781	1.004726	1.004726	1.011342	1.014178	1.014178	1.015123
Street Lighting	1.000000	1.005319	1.008865	1.010638	1.012411	1.014184	0.991135	0.992908	0.992908	0.991135	0.989362	0.991135
Other Public Sales	0.945991	0.941966	0.943308	0.983563	1.062731	1.080174	1.084200	1.064072	1.037236	0.974170	0.944649	0.937940
Peak Demand	0.8670	0.8180	0.8886	0.6849	0.5558	0.8260	1.0000	0.9063	0.7209	0.6694	0.9307	1.0000

Montana

<u>Sales</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Residential	0.107732	0.090082	0.087508	0.074456	0.065995	0.068070	0.085773	0.106820	0.084485	0.068890	0.070653	0.089535
Small C&I	0.093491	0.085772	0.086093	0.076765	0.072513	0.072979	0.087294	0.101718	0.087830	0.076810	0.073329	0.085405
Large C&I	0.096196	0.081427	0.081005	0.082870	0.093557	0.057720	0.081133	0.079114	0.084977	0.085082	0.079120	0.097801
Street Lighting	0.087025	0.086132	0.083608	0.082954	0.082445	0.082100	0.081888	0.082145	0.082353	0.082770	0.082922	0.083658
Other Public Sales	0.078918	0.072075	0.068467	0.068373	0.073841	0.088008	0.106864	0.125114	0.102380	0.080231	0.065325	0.070403
Interdepartmental	0.110106	0.093204	0.093717	0.082281	0.075893	0.072122	0.072091	0.079928	0.074670	0.074528	0.076374	0.095084
Company Use	0.104113	0.108903	0.092775	0.080928	0.082600	0.065784	0.079033	0.091845	0.075681	0.066611	0.067567	0.084161
Oil Fields	0.090937	0.077254	0.084814	0.082306	0.078921	0.080764	0.081969	0.082247	0.083141	0.085757	0.083876	0.088014
Westmoreland Coal	0.120161	0.105195	0.105009	0.090724	0.075387	0.063513	0.061163	0.059617	0.060915	0.069759	0.080767	0.107792
<u>Customers</u>												
Residential	1.001084	1.001034	1.000319	0.997322	0.997750	0.998208	0.999037	0.999451	1.000026	1.000902	1.002217	1.002649
Small C&I	0.984218	0.983852	0.984584	0.993531	1.005915	1.011062	1.013518	1.014834	1.012466	1.002830	0.997742	0.995447
Large C&I	0.982314	0.982581	0.984452	0.994610	1.005301	1.012251	1.016795	1.016795	1.011984	1.002094	0.997015	0.993808
Street Lighting	1.061339	1.046068	1.038432	1.033851	1.028506	1.026215	0.956732	0.959786	0.960550	0.960550	0.961313	0.966658
Other Public Sales	0.970396	0.967320	0.974241	0.995771	1.024990	1.030373	1.033449	1.031911	1.012687	0.996540	0.985006	0.977316
Peak Demand	0.9338	0.8941	0.8238	0.7129	0.6639	0.9219	1.0000	0.9563	0.8320	0.7241	0.8561	1.0000

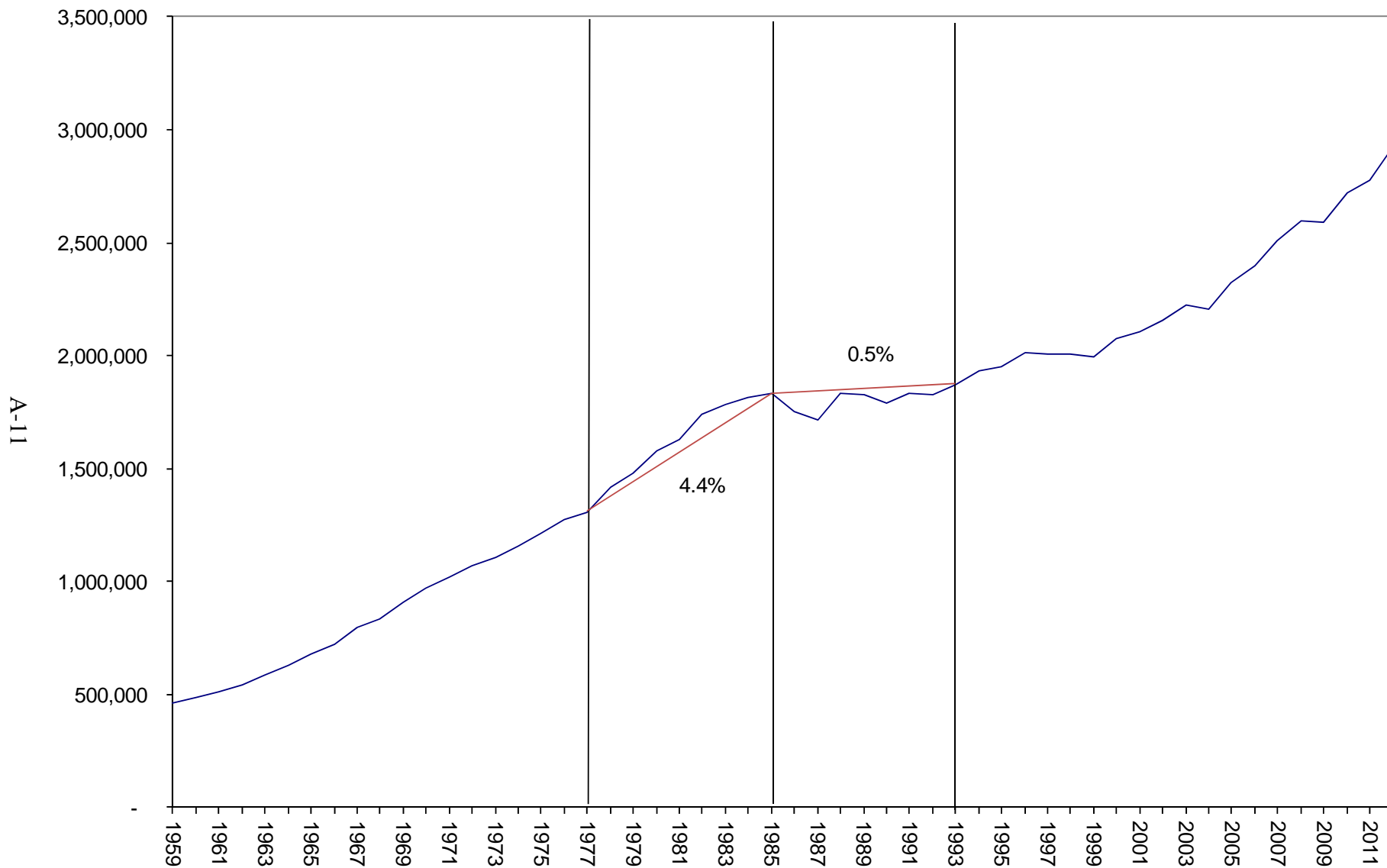
Montana-Dakota Utilities Co.
Billing-Month to Calendar-Month Allocation Factors

<u>Residential</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
North Dakota	50.1%	49.1%	51.5%	50.4%	49.5%	53.0%	47.0%	52.7%	49.8%	50.0%	49.2%	52.1%
South Dakota	54.1%	54.5%	56.5%	55.9%	54.2%	58.8%	52.4%	57.3%	51.9%	54.7%	53.9%	55.8%
Montana	53.6%	52.4%	56.9%	54.9%	52.7%	58.2%	50.7%	58.6%	52.4%	54.3%	51.9%	55.6%
<u>Small Commercial & Industrial</u>												
North Dakota	48.7%	47.7%	49.1%	48.6%	48.2%	52.0%	46.3%	49.4%	47.6%	47.6%	49.1%	52.1%
South Dakota	54.1%	53.2%	57.8%	53.9%	52.5%	56.6%	50.5%	57.6%	49.5%	54.7%	53.0%	56.6%
Montana	50.5%	49.6%	53.1%	50.7%	47.8%	55.9%	47.9%	54.1%	47.9%	49.8%	48.7%	51.2%
<u>Large Commercial & Industrial</u>												
North Dakota	47.0%	45.2%	47.1%	45.6%	46.5%	49.4%	44.8%	47.3%	44.8%	45.5%	46.9%	48.8%
South Dakota	58.9%	52.5%	65.4%	61.2%	55.3%	63.2%	55.1%	65.0%	48.7%	61.1%	54.3%	59.6%
Montana	37.5%	31.6%	31.9%	28.5%	26.7%	25.6%	31.0%	32.1%	28.3%	28.9%	32.5%	34.2%
<u>Street Lighting</u>												
North Dakota	42.7%	42.4%	40.3%	40.5%	40.4%	42.9%	39.1%	40.2%	40.5%	39.9%	42.2%	45.2%
South Dakota	47.7%	50.4%	46.6%	47.5%	48.2%	50.0%	47.7%	47.6%	48.9%	47.2%	51.0%	51.7%
Montana	45.7%	47.6%	42.6%	44.0%	44.1%	46.7%	42.8%	43.6%	44.8%	43.0%	47.5%	48.4%
<u>Other Public Sales</u>												
North Dakota	49.0%	48.5%	46.5%	47.4%	46.9%	49.0%	46.2%	47.8%	47.6%	46.5%	50.1%	51.5%
South Dakota	59.9%	44.1%	73.1%	62.7%	55.4%	60.9%	54.7%	66.2%	41.8%	68.1%	46.2%	56.8%
Montana	51.2%	45.1%	57.1%	51.3%	48.4%	52.3%	44.4%	52.8%	45.3%	52.0%	48.0%	52.0%
<u>Interdepartmental</u>												
North Dakota	54.6%	50.2%	54.7%	53.1%	52.4%	55.9%	48.9%	55.5%	51.4%	53.8%	52.0%	54.1%
South Dakota	17.8%	17.2%	14.9%	15.1%	14.2%	18.6%	16.5%	14.8%	17.0%	16.2%	33.7%	18.2%
Montana	43.9%	39.0%	49.5%	45.9%	44.5%	51.4%	44.2%	54.7%	42.9%	47.9%	41.2%	45.3%
<u>Company Use</u>												
North Dakota	42.3%	43.0%	39.7%	39.8%	40.7%	42.9%	39.1%	39.1%	39.9%	38.2%	43.5%	45.2%
South Dakota	70.7%	76.1%	68.8%	71.3%	71.4%	71.9%	70.3%	70.5%	72.1%	70.4%	75.0%	74.5%
Montana	59.6%	61.0%	60.1%	61.7%	57.7%	60.2%	56.2%	59.1%	56.1%	57.8%	60.0%	62.6%

**Montana-Dakota Utilities Co.
Integrated System
Historical Energy Requirements**

<u>Year</u>	<u>Total Energy Requirements MWh</u>	<u>%Inc/Dec</u>
1959	463,307	
1960	488,316	5.40%
1961	514,086	5.28%
1962	545,306	6.07%
1963	586,589	7.57%
1964	628,616	7.16%
1965	682,214	8.53%
1966	725,389	6.33%
1967	798,855	10.13%
1968	837,504	4.84%
1969	908,231	8.44%
1970	970,490	6.85%
1971	1,021,876	5.29%
1972	1,073,560	5.06%
1973	1,107,691	3.18%
1974	1,155,351	4.30%
1975	1,210,168	4.74%
1976	1,274,391	5.31%
1977	1,307,542	2.60%
1978	1,418,366	8.48%
1979	1,481,019	4.42%
1980	1,581,612	6.79%
1981	1,629,323	3.02%
1982	1,740,859	6.85%
1983	1,783,753	2.46%
1984	1,815,453	1.78%
1985	1,834,294	1.04%
1986	1,751,503	-4.51%
1987	1,716,377	-2.01%
1988	1,834,232	6.87%
1989	1,828,665	-0.30%
1990	1,788,854	-2.18%
1991	1,836,243	2.65%
1992	1,827,866	-0.46%
1993	1,870,268	2.32%
1994	1,934,561	3.44%
1995	1,952,872	0.95%
1996	2,014,830	3.17%
1997	2,005,195	-0.48%
1998	2,007,534	0.12%
1999	1,996,647	-0.54%
2000	2,077,579	4.05%
2001	2,104,119	1.28%
2002	2,158,431	2.58%
2003	2,226,531	3.16%
2004	2,204,012	-1.01%
2005	2,327,117	5.59%
2006	2,397,793	3.04%
2007	2,510,540	4.70%
2008	2,596,990	3.44%
2009	2,593,368	-0.14%
2010	2,718,192	4.81%
2011	2,776,082	2.13%
2012	2,919,752	5.18%

Montana-Dakota Integrated System Total Energy Requirements



APPENDIX B

Integrated System Historical and Forecasted Exogenous Variables

Montana-Dakota Utilities Co.
Integrated System
Historical and Forecasted Electricity Prices
cents/kWh

<u>Year</u>	<u>Residential Prices</u>			<u>Small C&I Prices</u>			<u>Large C&I Prices</u>		
	<u>MT</u>	<u>ND</u>	<u>SD</u>	<u>MT</u>	<u>ND</u>	<u>SD</u>	<u>MT</u>	<u>ND</u>	<u>SD</u>
1987	7.944	7.010	9.266	6.408	7.395	8.791	4.823	5.903	6.715
1988	7.437	7.056	9.060	6.174	7.988	8.624	4.755	5.951	6.460
1989	7.442	6.938	9.077	6.219	7.862	8.618	4.763	5.834	6.410
1990	7.445	6.949	9.106	6.177	7.883	8.620	4.753	5.747	6.338
1991	7.426	6.955	9.103	6.205	7.908	8.602	4.769	5.702	6.349
1992	7.469	6.953	9.197	6.278	7.890	8.597	4.766	5.604	6.294
1993	7.449	6.918	9.102	6.245	7.897	8.581	4.773	5.502	6.252
1994	7.432	6.930	8.940	6.186	7.741	8.439	4.743	5.472	6.260
1995	7.422	6.795	8.815	6.208	7.617	8.347	4.777	5.426	6.134
1996	7.400	6.744	8.768	6.157	7.559	8.295	4.802	5.376	6.041
1997	7.408	6.845	8.875	6.191	7.666	8.384	4.977	5.510	6.177
1998	7.413	6.878	8.962	6.193	7.697	8.375	5.012	5.549	6.146
1999	7.433	6.833	8.923	6.200	7.622	8.339	4.888	5.447	6.134
2000	7.445	6.731	8.783	6.177	7.512	8.243	4.850	5.339	5.989
2001	7.356	6.839	8.862	6.142	7.651	8.338	4.840	5.431	6.182
2002	7.335	6.753	8.807	6.109	7.552	8.294	4.821	5.509	6.162
2003	7.331	6.812	8.884	6.087	7.606	8.379	4.517	5.510	6.273
2004	7.375	7.172	9.098	6.133	7.861	8.565	4.524	5.720	6.440
2005	7.352	7.010	8.918	6.142	7.681	8.437	4.512	5.635	6.356
2006	7.337	7.342	9.165	6.106	8.027	8.689	4.500	6.009	6.596
2007	7.338	7.823	9.616	6.116	8.544	9.142	4.477	6.573	7.134
2008	8.370	7.844	9.606	7.288	8.683	9.125	5.183	6.673	7.167
2009	7.844	7.236	9.176	6.993	8.121	8.646	5.257	6.228	6.865
2010	7.973	7.664	9.243	7.171	8.596	8.779	4.946	6.709	7.217
2011	8.301	8.020	9.082	7.478	8.935	8.667	5.432	7.040	7.156
2012			9.209						
2013			9.817						
2014			9.905						
2015			10.529						
2016			11.866						
2017			12.103						
2018			12.345						
2019			12.592						
2020			13.851						
2021			14.544						
2022			14.835						
2023			15.132						
2024			15.889						
2025			16.207						
2026			16.531						
2027			17.358						
2028			17.705						
2029			18.059						
2030			18.420						
2031			18.788						
2032			19.164						

SOURCES:

1987-2011: Historical prices calculated from Montana-Dakota Utilities Co.,
Electric Operating Revenues Reports

2012-2032: Forecasted prices (only needed for South Dakota residential)

**Montana-Dakota Utilities Co.
Integrated System
Historical Natural Gas Prices
\$/Dk**

<u>Year</u>	<u>Residential Price</u>	<u>Firm Price</u>
1987	\$5.290	4.890
1988	4.870	4.520
1989	4.400	4.060
1990	4.460	4.070
1991	4.570	4.200
1992	4.840	4.460
1993	5.050	4.690
1994	4.860	4.430
1995	4.380	3.910
1996	4.130	3.710
1997	4.540	4.090
1998	4.850	4.300
1999	5.080	4.540
2000	5.920	5.390
2001	7.420	6.870
2002	4.570	4.030
2003	6.830	6.290
2004	8.560	7.970
2005	10.490	9.840
2006	9.870	9.150
2007	7.780	7.090
2008	9.420	8.770
2009	7.820	7.190
2010	7.050	6.370
2011	7.030	6.370

SOURCE:

1987-2011: CSBEPFL Rate Reporting Class Report
Gas Year-to-Date Report for Year-end

**Bismarck, ND and Aberdeen, SD
Heating Degree Days (HDD)
and
Cooling Degree Days (CDD)
(Annual)**

	HDD		CDD	
	<u>MT & ND</u>	<u>SD</u>	<u>MT & ND</u>	<u>SD</u>
1987	7,314	6,825	532	758
1988	8,525	8,207	860	1061
1989	9,086	9,007	672	706
1990	8,061	7,652	611	610
1991	8,052	7,650	709	826
1992	8,162	7,771	255	289
1993	9,144	8,650	217	415
1994	8,866	8,474	432	612
1995	9,027	8,926	522	622
1996	10,027	9,875	480	475
1997	8,450	8,854	609	540
1998	7,765	7,502	633	645
1999	7,710	7,401	457	507
2000	8,412	8,436	549	554
2001	8,039	8,348	668	727
2002	8,532	8,369	745	788
2003	8,493	8,319	737	601
2004	8,183	8,035	379	341
2005	7,792	7,871	555	659
2006	7,525	7,437	793	704
2007	8,345	8,465	666	698
2008	8,946	9,022	524	499
2009	9,108	8,847	331	327
2010	8,643	8,255	507	661
2011	8,750	8,668	425	729
NORMAL	8,558	8,534	520	525

**Montana-Dakota Utilities Co.
Service Territory Counties
Personal Income (2005 \$s)**

<u>Year</u>	<u>Montana</u>	<u>North Dakota</u>	<u>South Dakota</u>
1987	1,354,787	4,389,817	628,706
1988	1,253,534	3,908,520	588,237
1989	1,328,120	4,153,257	623,346
1990	1,277,145	4,268,043	640,982
1991	1,333,852	4,183,130	609,579
1992	1,389,251	4,517,219	656,987
1993	1,422,668	4,600,756	668,407
1994	1,385,573	4,677,872	609,904
1995	1,358,312	4,601,284	617,092
1996	1,369,099	5,004,700	697,103
1997	1,371,309	4,788,486	667,947
1998	1,443,757	5,276,840	734,706
1999	1,467,940	5,276,812	759,765
2000	1,468,712	5,619,407	818,431
2001	1,533,791	5,816,147	843,749
2002	1,481,980	5,682,570	710,873
2003	1,590,087	6,188,066	858,840
2004	1,598,758	6,265,972	862,610
2005	1,621,152	6,564,135	872,921
2006	1,623,967	6,688,042	691,142
2007	1,755,149	7,221,027	874,388
2008	1,800,098	7,651,696	1,011,045
2009	1,807,059	8,022,889	905,551
2010	1,871,880	8,411,014	926,202
2011	1,951,623	9,024,454	955,432

SOURCES:

1987-2009 U.S. Dept. of Commerce
2010 & 2011 Woods & Poole Economics

Personal Consumption Expenditure Deflator

<u>Year</u>	<u>Personal Consumption Expenditure Deflator (2005=100)</u>	<u>Inflation Rate</u>
1987	63.59	
1988	66.12	4.0%
1989	68.99	4.3%
1990	72.15	4.6%
1991	74.75	3.6%
1992	76.95	2.9%
1993	78.64	2.2%
1994	80.26	2.1%
1995	82.04	2.2%
1996	83.83	2.2%
1997	85.39	1.9%
1998	86.21	1.0%
1999	87.60	1.6%
2000	89.78	2.5%
2001	91.49	1.9%
2002	92.74	1.4%
2003	94.66	2.1%
2004	97.12	2.6%
2005	100.00	3.0%
2006	102.72	2.7%
2007	105.50	2.7%
2008	108.94	3.3%
2009	109.17	0.2%
2010	111.11	1.8%
2011	113.58	2.2%
2012	116.80	2.8%
2013	120.19	2.9%
2014	123.75	3.0%
2015	127.48	3.0%
2016	131.38	3.1%
2017	135.46	3.1%
2018	139.74	3.2%
2019	144.23	3.2%
2020	148.93	3.3%
2021	153.86	3.3%
2022	159.03	3.4%
2023	164.45	3.4%
2024	170.14	3.5%
2025	176.12	3.5%
2026	182.32	3.5%
2027	188.75	3.5%
2028	195.43	3.5%
2029	202.37	3.6%
2030	209.58	3.6%
2031	217.06	3.6%
2032	224.83	3.6%

SOURCES:

1969-2010 U.S. Department of Commerce
 2011-2032 Woods & Poole Economics, Inc.

**Montana-Dakota Utilities Co.
Integrated System
Residential Sector
Households and Customers
for Service Territory Counties**

<u>Year</u>	<u>Montana</u>		<u>North Dakota</u>		<u>South Dakota</u>	
	<u>Number of Households</u>	<u>Average Customers</u>	<u>Number of Households</u>	<u>Average Customers</u>	<u>Number of Households</u>	<u>Average Customers</u>
1987	26,312	19,319	79,044	57,618	12,607	7,134
1988	25,825	19,111	78,603	57,307	12,516	7,078
1989	25,283	18,895	77,948	56,829	12,305	6,996
1990	24,505	18,747	76,942	56,592	12,052	6,922
1991	24,091	18,594	77,087	57,076	11,956	6,885
1992	24,049	18,557	77,651	57,305	11,846	6,868
1993	23,940	18,552	77,781	57,586	11,661	6,900
1994	23,950	18,534	78,009	57,794	11,681	6,914
1995	24,045	18,597	78,348	58,130	11,660	6,912
1996	24,188	18,689	79,774	58,529	11,775	6,936
1997	24,100	18,803	80,321	58,787	11,538	6,919
1998	24,019	18,839	80,967	59,081	11,384	6,913
1999	23,884	18,799	81,058	58,988	11,505	6,883
2000	23,829	18,716	81,566	59,332	11,459	6,866
2001	24,092	18,645	83,396	59,405	11,545	6,816
2002	23,799	18,635	83,797	59,608	11,407	6,768
2003	23,959	18,602	85,009	59,953	11,391	6,724
2004	23,931	18,539	85,375	60,279	11,204	6,681
2005	23,976	18,502	86,433	60,641	11,133	6,648
2006	23,945	18,505	87,358	61,026	10,989	6,620
2007	24,224	18,531	89,030	61,451	10,962	6,593
2008	24,285	18,582	89,973	62,068	10,897	6,612
2009	24,574	18,636	91,208	62,631	10,767	6,619
2010	24,535	18,716	91,691	63,619	10,763	6,609
2011	24,566	18,883	92,465	65,196	10,801	6,602
2012	24,619	19,233	93,344	67,996	10,851	6,612
2013	24,678	19,633	94,243	69,596	10,899	6,622
2014	24,749	20,033	95,200	70,796	10,959	6,635
2015	24,813	20,383	96,137	71,796	11,011	6,645
2016	24,864	20,733	97,012	72,696	11,059	6,655
2017	24,888	21,033	97,806	73,596	11,095	6,662
2018	24,896	21,333	98,513	74,396	11,124	6,668
2019	24,885	21,583	99,163	75,196	11,145	6,673
2020	24,866	21,833	99,771	75,896	11,162	6,676
2021	24,840	22,033	100,355	76,596	11,174	6,678
2022	24,798	22,233	100,863	77,196	11,180	6,680
2023	24,742	22,333	101,326	77,796	11,180	6,680
2024	24,680	22,433	101,752	78,296	11,178	6,679
2025	24,613	22,533	102,158	78,796	11,173	6,678
2026	24,543	22,633	102,541	79,196	11,167	6,677
2027	24,469	22,733	102,910	79,596	11,158	6,675
2028	24,392	22,783	103,260	79,896	11,150	6,674
2029	24,311	22,833	103,587	80,196	11,137	6,671
2030	24,228	22,883	103,899	80,496	11,123	6,668
2031	24,143	22,933	104,204	80,796	11,111	6,666
2032	24,056	22,983	104,496	81,096	11,095	6,662

* / Actual customer numbers for 1999 are unavailable due to the installation of a new CIS.
This number is an estimate.

SOURCES:

Households

1985, 1990, 2000, 2010: U.S. Department of Commerce

All other years: Estimated and projected by Woods & Poole

Customers

1987-2011: Actuals from Montana-Dakota Utilities Co. Customer Information System Active Customers Report

2012-2032: Montana-Dakota forecast

**Montana-Dakota Utilities Co.
Integrated System
Employment Data
Total Employment less Farming and Mining Employment**

Year	Montana				North Dakota				South Dakota	
	Number of Employees	Growth Rate	Adjusted Employment	Growth Rate	Number of Employees	Growth Rate	Adjusted Employment	Growth Rate	Number of Employees	Growth Rate
1987	27,824				93,836				11,400	
1988	27,593	-0.83%		-0.83%	94,528	0.74%		0.74%	11,412	0.11%
1989	28,316	2.62%		2.62%	95,929	1.48%		1.48%	11,310	-0.89%
1990	28,322	0.02%		0.02%	97,843	2.00%		2.00%	11,520	1.86%
1991	28,781	1.62%		1.62%	100,241	2.45%		2.45%	11,332	-1.63%
1992	28,543	-0.83%		-0.83%	101,445	1.20%		1.20%	11,318	-0.12%
1993	29,096	1.94%		1.94%	104,372	2.89%		2.89%	11,383	0.57%
1994	30,488	4.78%		4.78%	109,298	4.72%		4.72%	12,281	7.89%
1995	30,255	-0.76%		-0.76%	109,780	0.44%		0.44%	12,011	-2.20%
1996	30,139	-0.38%		-0.38%	111,890	1.92%		1.92%	12,232	1.84%
1997	30,524	1.28%		1.28%	113,785	1.69%		1.69%	12,141	-0.74%
1998	30,965	1.44%		1.44%	116,643	2.51%		2.51%	12,385	2.01%
1999	30,781	-0.59%		-0.59%	118,410	1.51%		1.51%	12,383	-0.02%
2000	30,844	0.20%		0.20%	120,501	1.77%		1.77%	12,546	1.32%
2001	30,336	-1.65%		-1.65%	120,385	-0.10%		-0.10%	12,517	-0.23%
2002	30,433	0.32%		0.32%	122,124	1.44%		1.44%	12,338	-1.43%
2003	30,855	1.39%		1.39%	123,841	1.41%		1.41%	12,164	-1.41%
2004	30,967	0.36%		0.36%	126,432	2.09%		2.09%	12,342	1.46%
2005	30,860	-0.35%		-0.35%	129,301	2.27%		2.27%	12,499	1.27%
2006	31,201	1.10%		1.10%	133,429	3.19%		3.19%	12,607	0.86%
2007	32,020	2.62%		2.62%	135,911	1.86%		1.86%	12,583	-0.19%
2008	32,378	1.12%		1.12%	138,554	1.94%		1.94%	12,625	0.33%
2009	32,311	-0.21%		-0.21%	140,173	1.17%		1.17%	12,658	0.26%
2010	32,452	0.44%		0.44%	144,187	2.86%		2.86%	12,821	1.29%
2011	33,006	1.71%		1.71%	149,275	3.53%		3.53%	12,959	1.08%
2012	33,171	0.50%	34,077	3.24%	151,465	1.47%	158,764	6.36%	12,989	0.23%
2013	33,379	0.63%	35,008	2.73%	153,624	1.43%	164,406	3.55%	13,017	0.22%
2014	33,592	0.64%	35,948	2.69%	155,823	1.43%	169,180	2.90%	13,060	0.33%
2015	33,800	0.62%	36,807	2.39%	158,020	1.41%	173,537	2.58%	13,095	0.27%
2016	34,017	0.64%	37,673	2.35%	160,238	1.40%	177,704	2.40%	13,122	0.21%
2017	34,218	0.59%	38,457	2.08%	162,481	1.40%	181,920	2.37%	13,150	0.21%
2018	34,431	0.62%	39,247	2.05%	164,755	1.40%	185,936	2.21%	13,189	0.30%
2019	34,638	0.60%	39,951	1.79%	167,055	1.40%	189,995	2.18%	13,215	0.20%
2020	34,844	0.59%	40,661	1.78%	169,367	1.38%	193,843	2.03%	13,246	0.23%
2021	35,052	0.60%	41,283	1.53%	171,712	1.38%	197,729	2.00%	13,277	0.23%
2022	35,257	0.58%	41,910	1.52%	174,092	1.39%	201,393	1.85%	13,312	0.26%
2023	35,453	0.56%	42,351	1.05%	176,487	1.38%	205,090	1.84%	13,337	0.19%
2024	35,647	0.55%	42,795	1.05%	178,922	1.38%	208,553	1.69%	13,371	0.25%
2025	35,855	0.58%	43,241	1.04%	181,356	1.36%	212,043	1.67%	13,405	0.25%
2026	36,047	0.54%	43,689	1.04%	183,837	1.37%	215,289	1.53%	13,428	0.17%
2027	36,247	0.55%	44,139	1.03%	186,352	1.37%	218,557	1.52%	13,455	0.20%
2028	36,444	0.54%	44,494	0.80%	188,876	1.35%	221,570	1.38%	13,477	0.16%
2029	36,639	0.54%	44,851	0.80%	191,432	1.35%	224,599	1.37%	13,509	0.24%
2030	36,833	0.53%	45,208	0.80%	194,002	1.34%	227,644	1.36%	13,535	0.19%
2031	37,024	0.52%	45,566	0.79%	196,634	1.36%	230,706	1.35%	13,555	0.15%
2032	37,222	0.53%	45,926	0.79%	199,267	1.34%	233,784	1.33%	13,582	0.20%

SOURCES:

Number of Employees:

1969-2009: U.S. Department of Commerce
2010-2032: Woods & Poole Economics Inc.

Adjusted Employment:

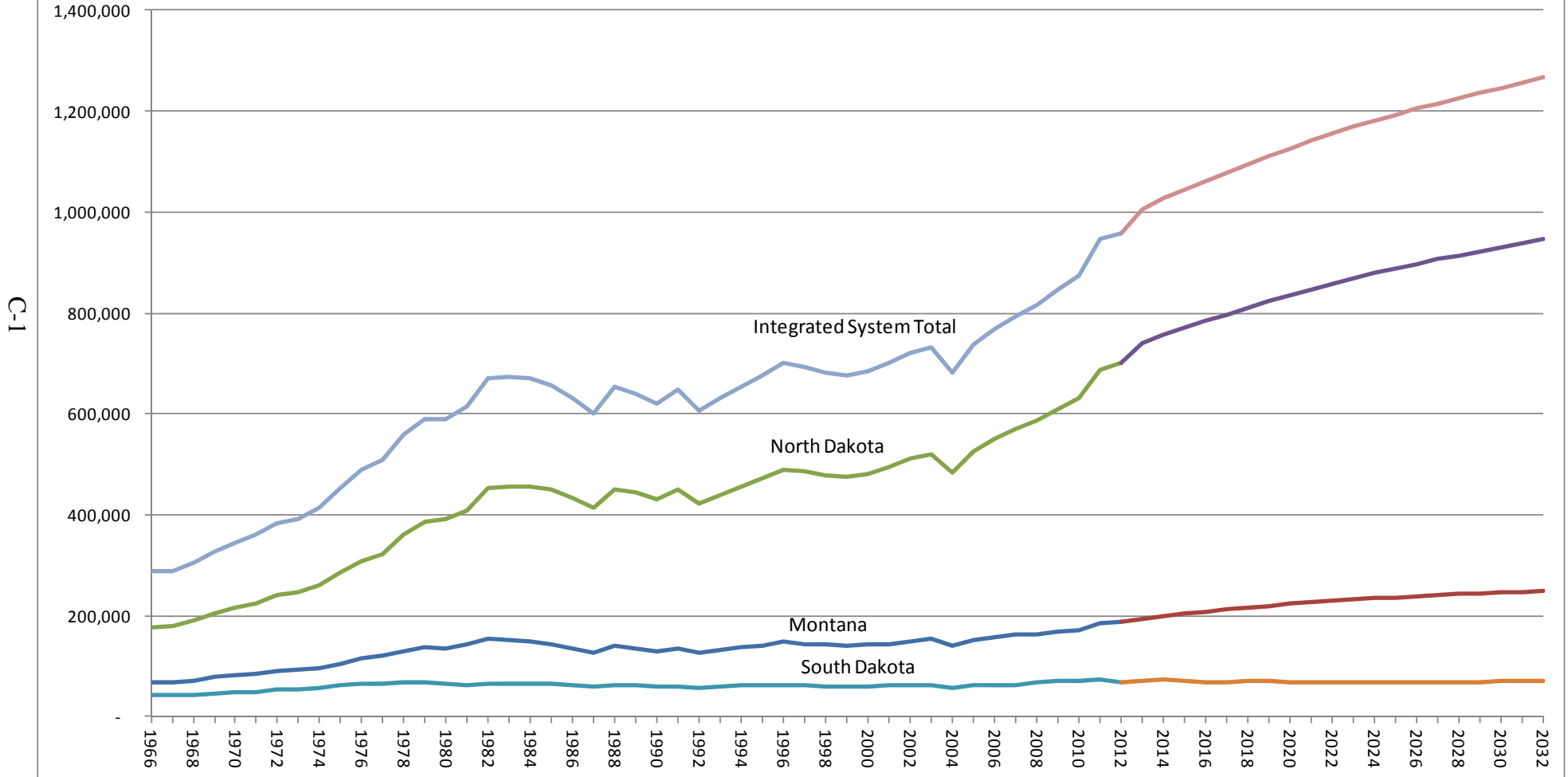
2012-2032: Employment was tied to the growth in residential customers by running a regression on the historical (1987-2011) ratio of actual residential customer numbers to employees. Those regression results were then applied on a forecasted basis to the adjusted forecast of residential customer numbers to arrive an adjusted forecast of number of employees.

NOTE: The number of employees used for the forecast is the total employment less farming and mining employment (most farms are not served by Montana-Dakota and the mining sector is forecasted separately (oil fields and coal mining)).

APPENDIX C

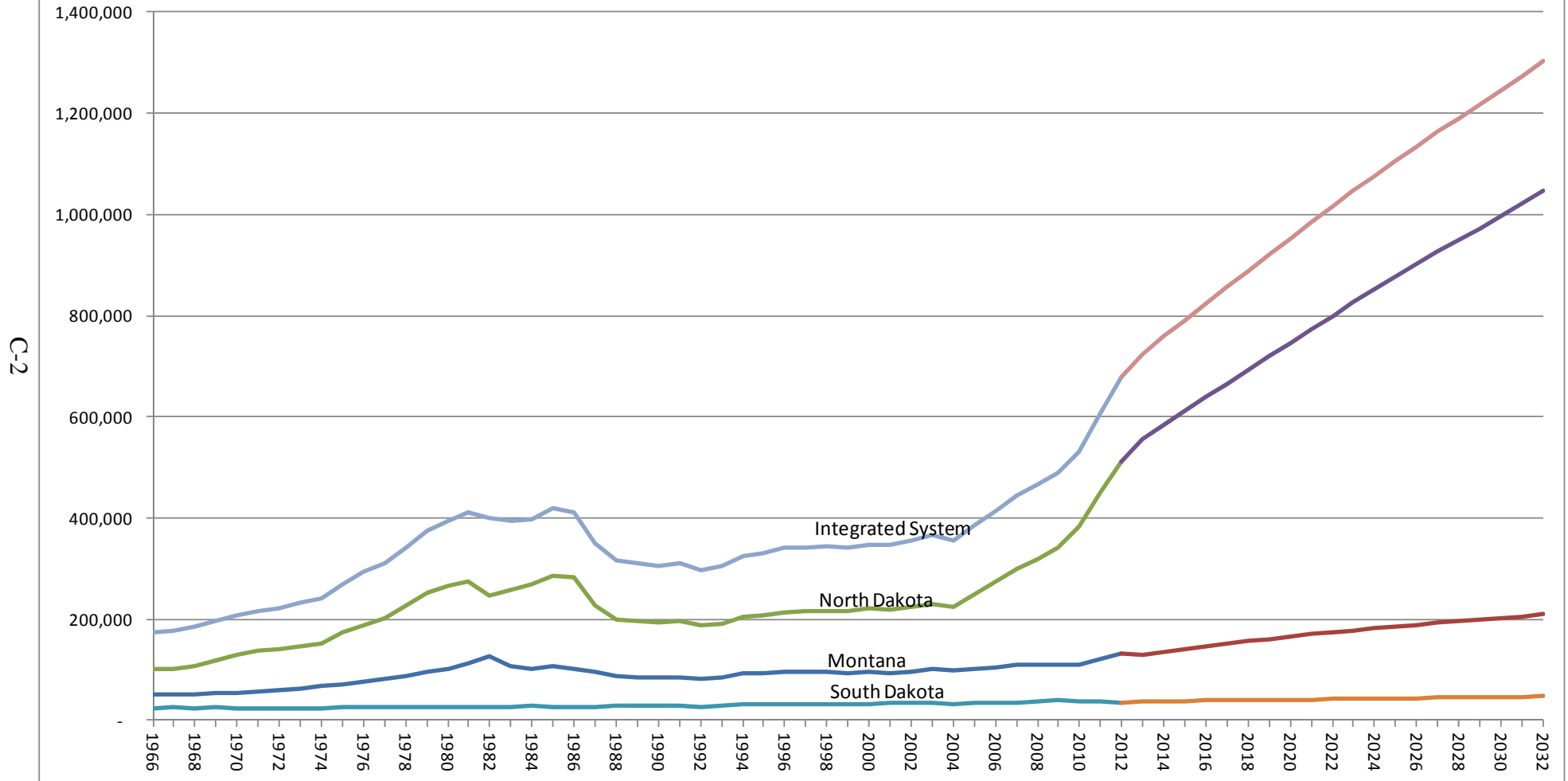
Integrated System Forecast Results

Montana-Dakota Integrated System Historical and Forecasted Residential Sales



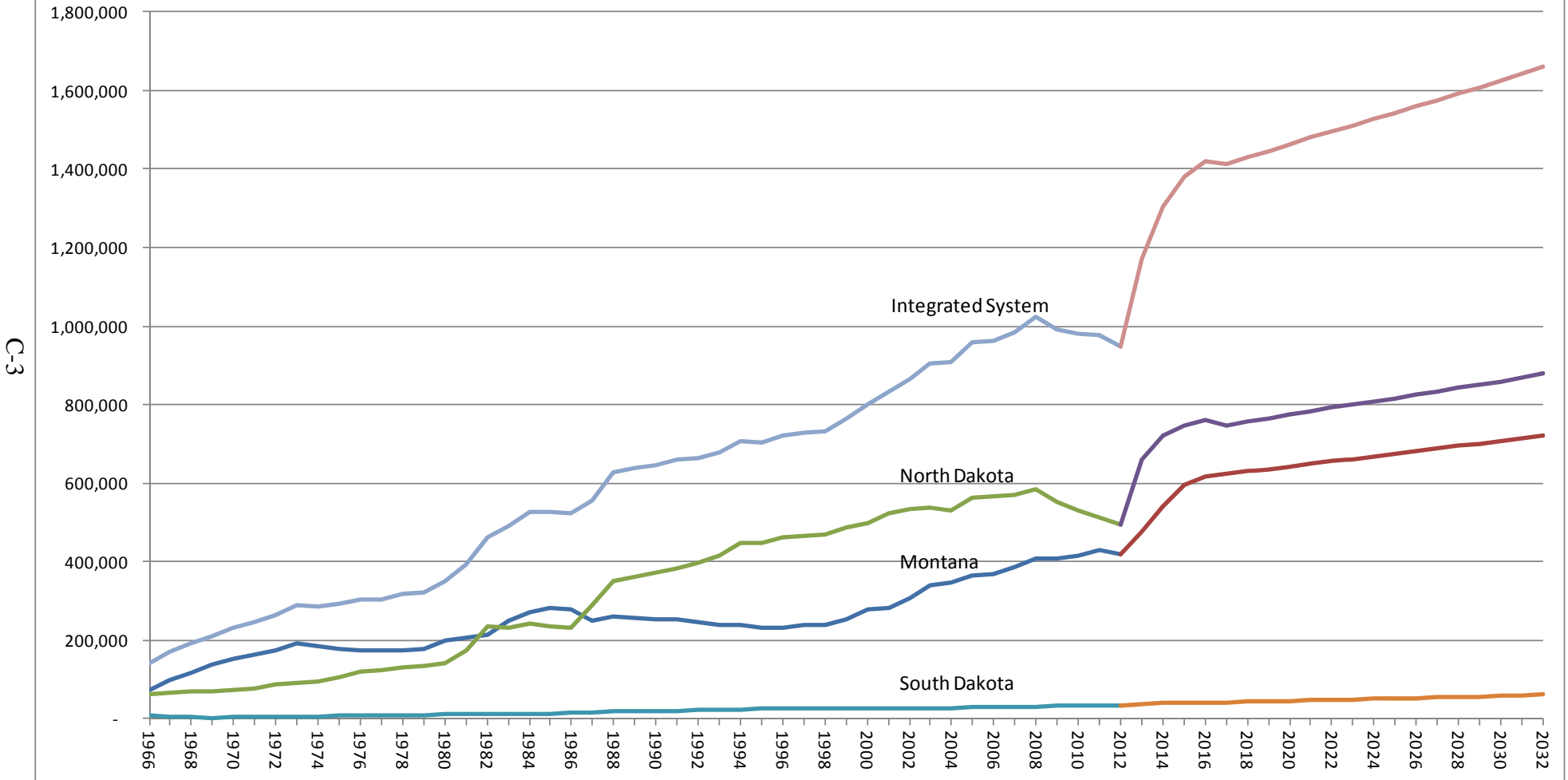
Montana-Dakota Integrated System

Historical and Forecasted Small C&I



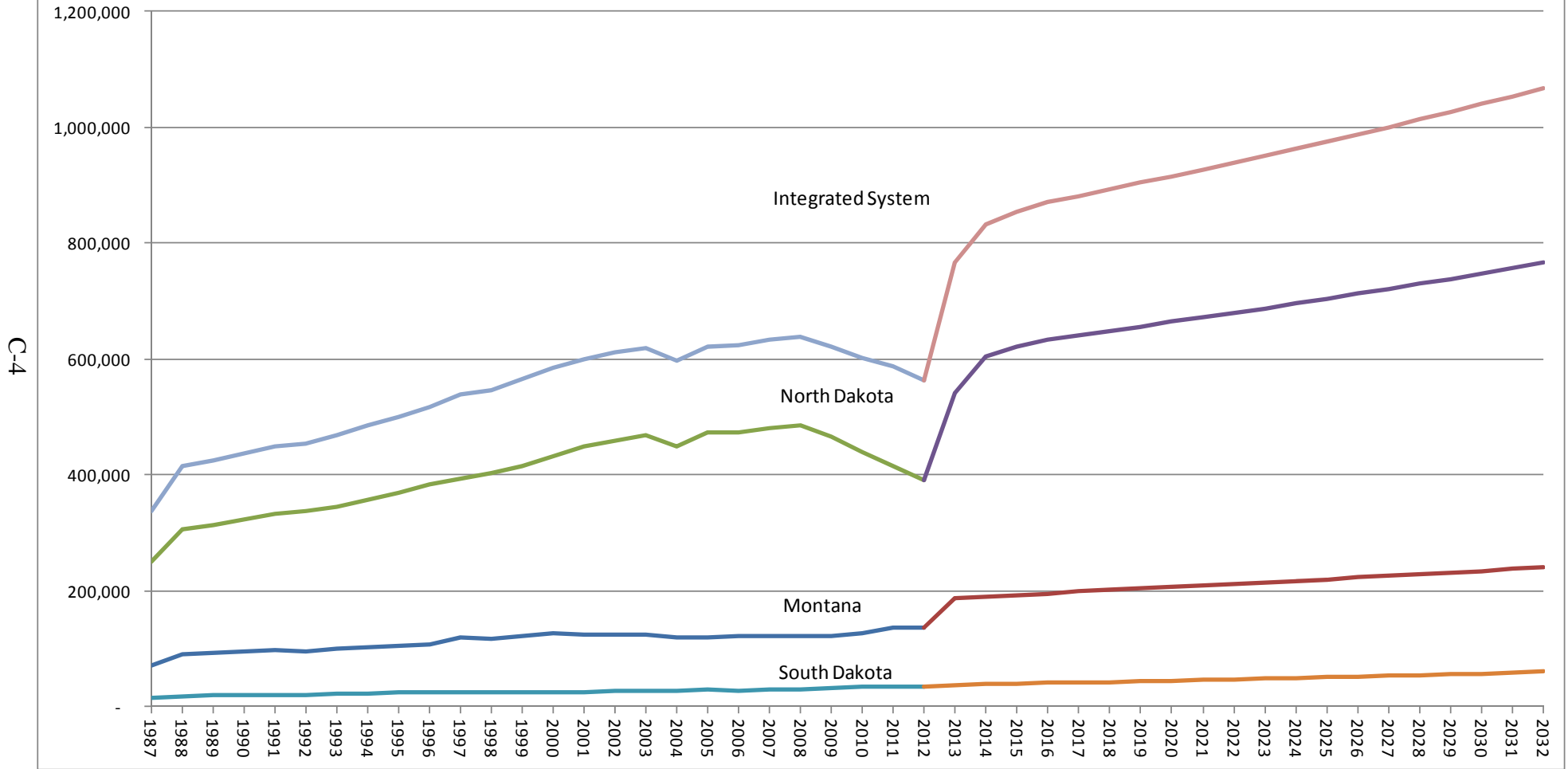
Montana-Dakota Integrated System

Historical and Forecasted Large C&I

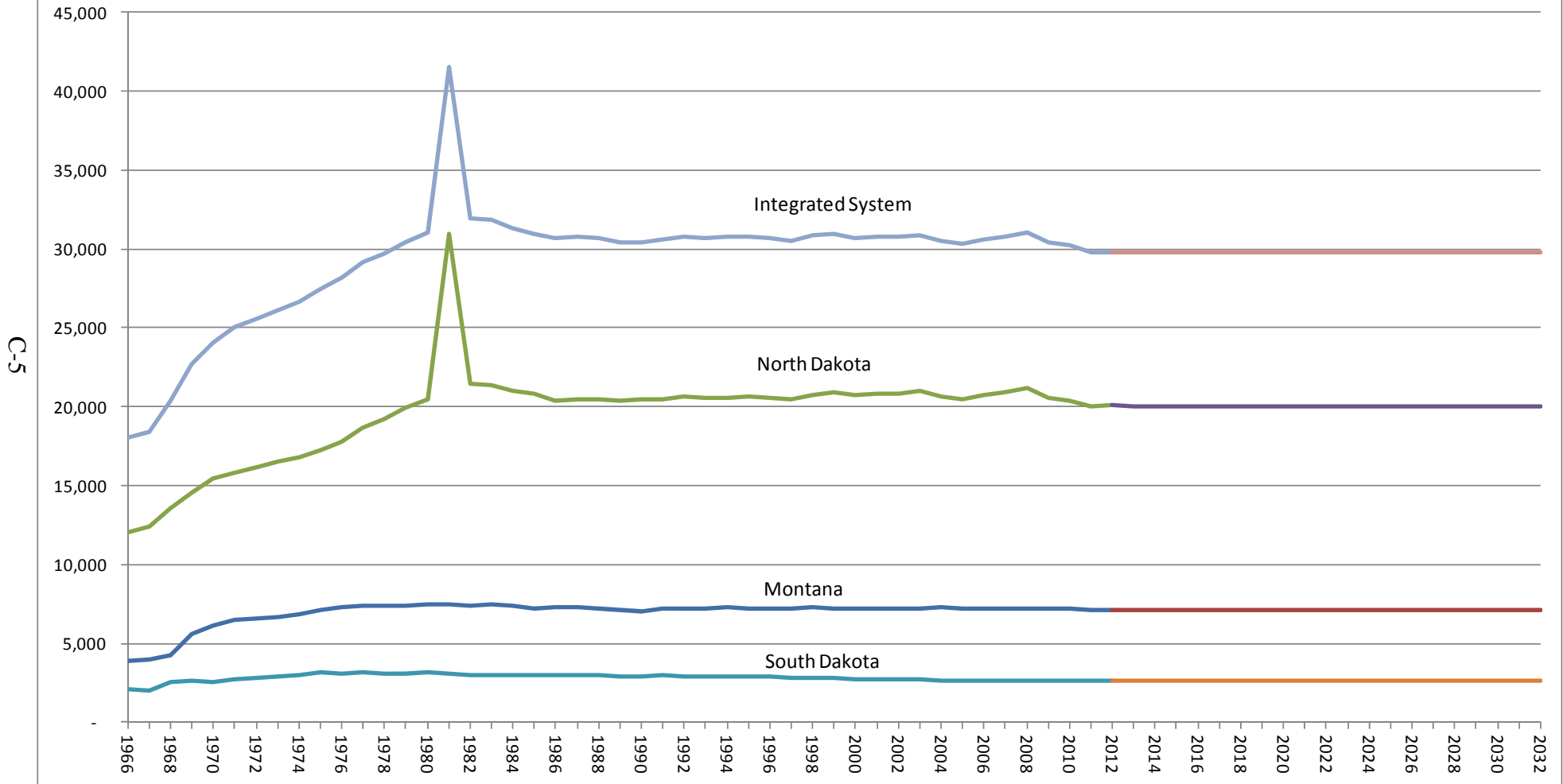


Montana-Dakota Integrated System

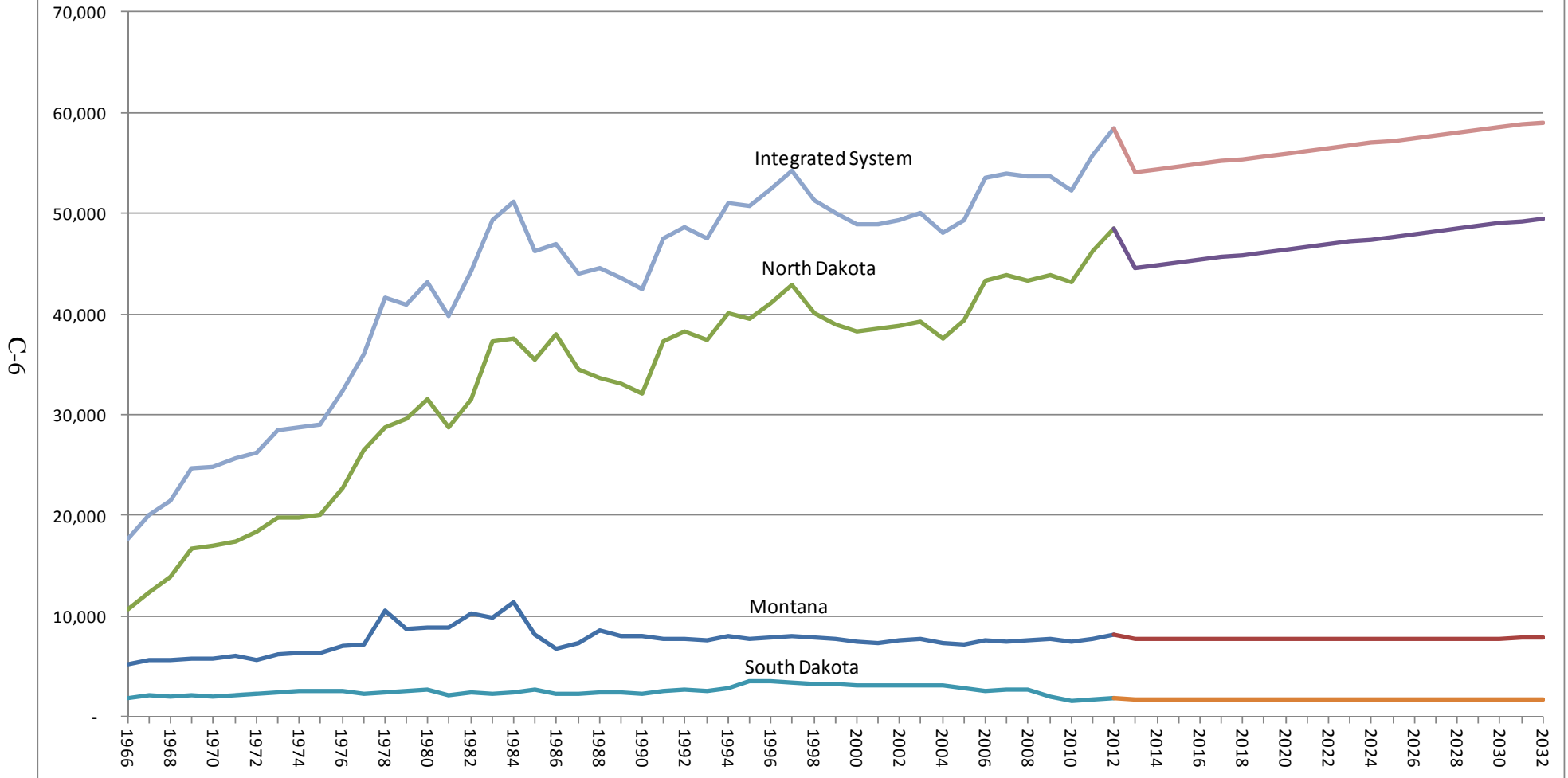
General LC&I Sales



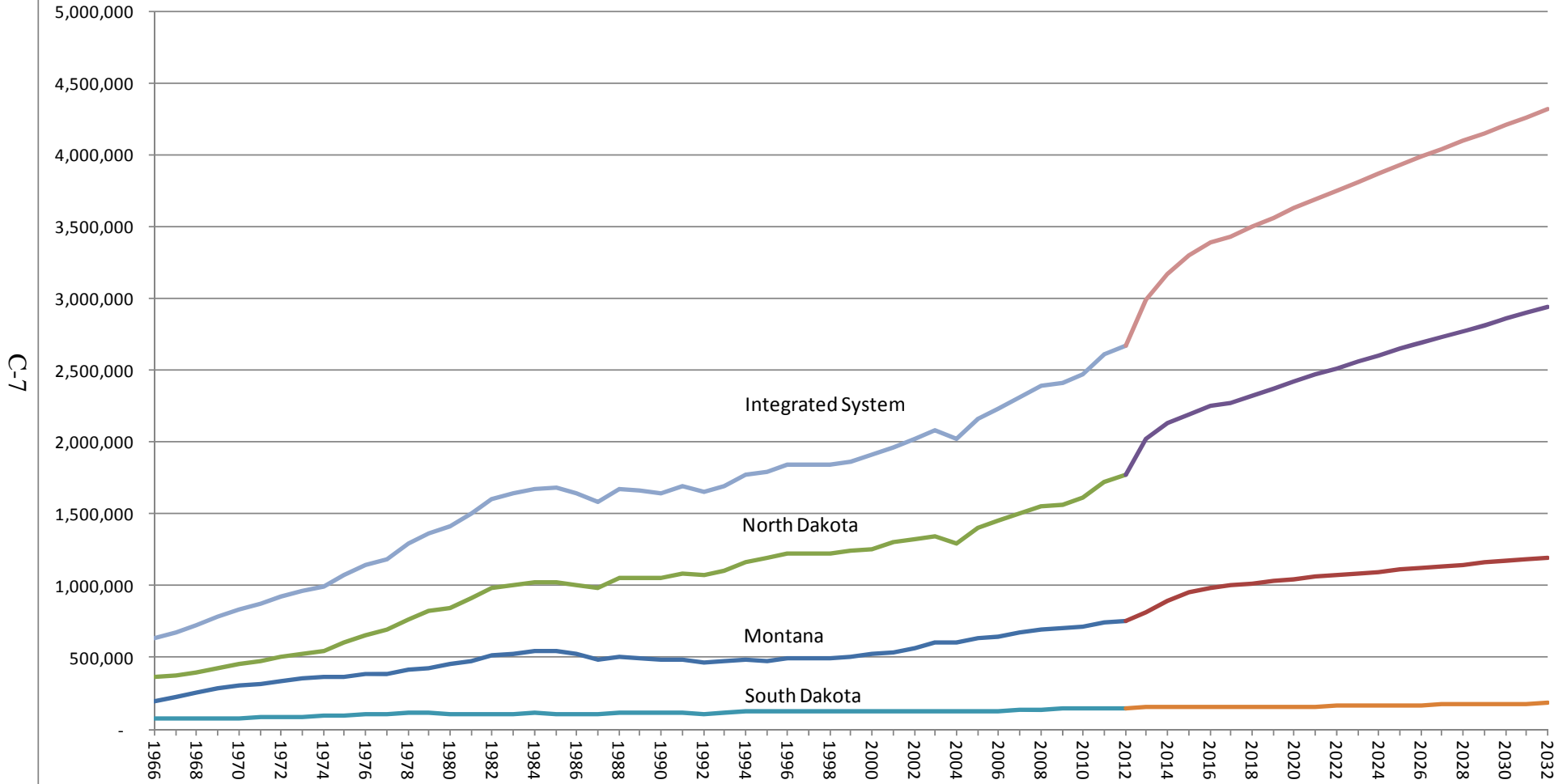
Montana-Dakota Integrated System Historical and Forecasted Street Lighting



Montana-Dakota Integrated System Historical and Forecasted Miscellaneous



Montana-Dakota Integrated System Historical and Forecasted Total Sales



**Forecasted Energy (MWh) and
Seasonal Demands (MW) Prior to Demand Response
Montana**

<u>Year</u>	<u>Summer Peak net of Energy Efficiency Programs</u>		<u>Winter Peak</u>		<u>Annual Energy Requirements</u>		<u>Load Factor</u>
	<u>(MW)</u>	<u>% Chg</u>	<u>(MW)</u>	<u>% Chg</u>	<u>(GWh)</u>	<u>% Chg</u>	<u>(%)</u>
2013	158.9		158.8		881.2		63.31%
2014	170.4	7.24%	172.0	8.31%	962.5	9.23%	64.48%
2015	180.5	5.93%	183.0	6.40%	1,029.7	6.98%	65.12%
2016	185.7	2.88%	188.7	3.11%	1,065.5	3.48%	65.32%
2017	188.4	1.45%	191.3	1.38%	1,081.9	1.54%	65.55%
2018	190.7	1.22%	193.7	1.25%	1,098.4	1.53%	65.75%
2019	192.9	1.15%	196.0	1.19%	1,114.1	1.43%	65.93%
2020	195.2	1.19%	198.4	1.22%	1,130.0	1.43%	65.90%
2021	197.3	1.08%	200.6	1.11%	1,145.0	1.33%	66.25%
2022	199.4	1.06%	202.8	1.10%	1,160.0	1.31%	66.41%
2023	201.2	0.90%	204.7	0.94%	1,173.1	1.13%	66.56%
2024	203.2	0.99%	206.7	0.98%	1,186.4	1.13%	66.47%
2025	205.0	0.89%	208.6	0.92%	1,199.7	1.12%	66.81%
2026	207.0	0.98%	210.6	0.96%	1,213.2	1.13%	66.90%
2027	209.0	0.97%	212.6	0.95%	1,226.8	1.12%	67.01%
2028	210.9	0.91%	214.5	0.89%	1,239.3	1.02%	66.90%
2029	212.7	0.85%	216.3	0.84%	1,252.0	1.02%	67.19%
2030	214.6	0.89%	218.2	0.88%	1,264.9	1.03%	67.29%
2031	216.6	0.93%	220.2	0.92%	1,277.8	1.02%	67.34%
2032	218.4	0.83%	222.1	0.86%	1,290.9	1.03%	67.29%

**Montana-Dakota Utilities Co.
Forecasted Energy (MWh) and
Seasonal Demands (MW) Prior to Demand Response
North Dakota**

<u>Year</u>	<u>Summer Peak net of Energy Efficiency Programs</u>		<u>Winter Peak</u>		<u>Annual Energy Requirments</u>		<u>Load Factor</u>
	<u>(MW)</u>	<u>% Chg</u>	<u>(MW)</u>	<u>% Chg</u>	<u>(GWh)</u>	<u>% Chg</u>	<u>(%)</u>
2013	393.9		393.7		2,184.6		63.31%
2014	407.2	3.38%	411.0	4.39%	2,300.1	5.29%	64.48%
2015	415.5	2.04%	421.4	2.53%	2,370.9	3.08%	65.14%
2016	423.2	1.85%	430.0	2.04%	2,428.0	2.41%	65.31%
2017	428.2	1.18%	434.7	1.09%	2,458.7	1.26%	65.55%
2018	436.0	1.82%	442.8	1.86%	2,511.1	2.13%	65.75%
2019	444.0	1.83%	451.1	1.87%	2,564.5	2.13%	65.93%
2020	451.8	1.76%	459.3	1.82%	2,616.1	2.01%	65.92%
2021	459.7	1.75%	467.4	1.76%	2,668.4	2.00%	66.26%
2022	467.0	1.59%	475.0	1.63%	2,717.0	1.82%	66.42%
2023	474.5	1.61%	482.8	1.64%	2,766.4	1.82%	66.55%
2024	481.8	1.54%	490.0	1.49%	2,813.5	1.70%	66.48%
2025	489.0	1.49%	497.5	1.53%	2,861.3	1.70%	66.80%
2026	496.0	1.43%	504.6	1.43%	2,906.7	1.59%	66.90%
2027	503.0	1.41%	511.7	1.41%	2,952.7	1.58%	67.01%
2028	509.8	1.35%	518.4	1.31%	2,996.0	1.47%	66.90%
2029	516.5	1.31%	525.3	1.33%	3,039.9	1.47%	67.19%
2030	523.4	1.34%	532.2	1.31%	3,084.5	1.47%	67.27%
2031	530.3	1.32%	539.3	1.33%	3,129.9	1.47%	67.38%
2032	537.4	1.34%	546.4	1.32%	3,176.0	1.47%	67.28%

**Montana-Dakota Utilities Co.
Forecasted Energy (MWh) and
Seasonal Demands (MW) Prior to Demand Response
South Dakota**

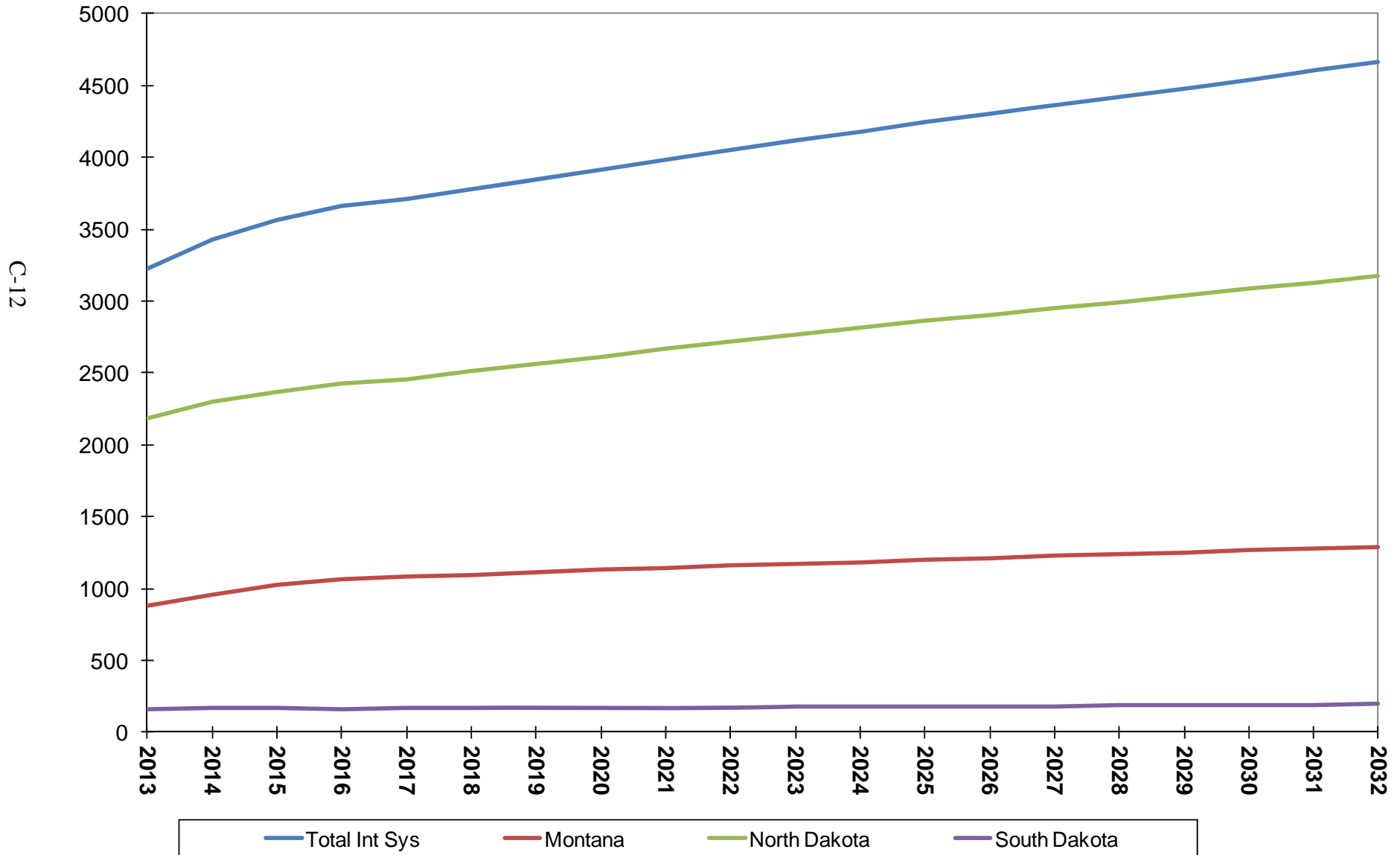
<u>Year</u>	<u>Summer Peak net of Energy Efficiency Programs</u>		<u>Winter Peak</u>		<u>Annual Energy Requirments</u>		<u>Load Factor</u>
	<u>(MW)</u>	<u>% Chg</u>	<u>(MW)</u>	<u>% Chg</u>	<u>(GWh)</u>	<u>% Chg</u>	<u>(%)</u>
2013	29.5		29.5		163.6		63.31%
2014	29.3	-0.68%	29.6	0.34%	165.7	1.28%	64.56%
2015	29.1	-0.68%	29.5	-0.34%	166.2	0.30%	65.20%
2016	28.8	-1.03%	29.2	-1.02%	165.2	-0.60%	65.30%
2017	29.1	1.04%	29.6	1.37%	167.2	1.21%	65.59%
2018	29.4	1.03%	29.9	1.01%	169.2	1.20%	65.70%
2019	29.7	1.02%	30.1	0.67%	171.2	1.18%	65.80%
2020	29.6	-0.34%	30.1	0.00%	171.0	-0.12%	65.77%
2021	29.7	0.34%	30.2	0.33%	172.3	0.76%	66.23%
2022	30.0	1.01%	30.5	0.99%	174.6	1.33%	66.44%
2023	30.3	1.00%	30.8	0.98%	176.7	1.20%	66.57%
2024	30.5	0.66%	31.0	0.65%	178.2	0.85%	66.51%
2025	30.9	1.31%	31.4	1.29%	180.5	1.29%	66.68%
2026	31.2	0.97%	31.7	0.96%	182.8	1.27%	66.88%
2027	31.4	0.64%	31.9	0.63%	184.4	0.88%	67.04%
2028	31.8	1.27%	32.3	1.25%	186.8	1.30%	66.87%
2029	32.1	0.94%	32.7	1.24%	189.3	1.34%	67.32%
2030	32.5	1.25%	33.1	1.22%	191.9	1.37%	67.40%
2031	33.0	1.54%	33.5	1.21%	194.5	1.35%	67.28%
2032	33.4	1.21%	33.9	1.19%	197.1	1.34%	67.18%

**Montana-Dakota Utilities Co.
Forecasted Energy (MWh) and
Seasonal Demands (MW) Prior to Demand Response
Integrated System**

<u>Year</u>	<u>Summer Peak net of Energy Efficiency Programs</u>		<u>Winter Peak</u>		<u>Annual Energy Requirements</u>		<u>Load Factor</u>
	<u>(MW)</u>	<u>% Chg</u>	<u>(MW)</u>	<u>% Chg</u>	<u>(GWh)</u>	<u>% Chg</u>	<u>(%)</u>
2013	582.3		582.0		3,229.4		63.31%
2014	606.9	4.22%	612.6	5.26%	3,428.3	6.16%	64.48%
2015	625.1	3.00%	633.9	3.48%	3,566.8	4.04%	65.14%
2016	637.7	2.02%	647.9	2.21%	3,658.7	2.58%	65.32%
2017	645.7	1.25%	655.6	1.19%	3,707.8	1.34%	65.55%
2018	656.1	1.61%	666.4	1.65%	3,778.7	1.91%	65.75%
2019	666.6	1.60%	677.2	1.62%	3,849.8	1.88%	65.93%
2020	676.6	1.50%	687.8	1.57%	3,917.1	1.75%	65.91%
2021	686.7	1.49%	698.2	1.51%	3,985.7	1.75%	66.26%
2022	696.4	1.41%	708.3	1.45%	4,051.6	1.65%	66.41%
2023	706.0	1.38%	718.3	1.41%	4,116.2	1.59%	66.56%
2024	715.5	1.35%	727.7	1.31%	4,178.1	1.50%	66.48%
2025	724.9	1.31%	737.5	1.35%	4,241.5	1.52%	66.79%
2026	734.2	1.28%	746.9	1.27%	4,302.7	1.44%	66.90%
2027	743.4	1.25%	756.2	1.25%	4,363.9	1.42%	67.01%
2028	752.5	1.22%	765.2	1.19%	4,422.1	1.33%	66.90%
2029	761.3	1.17%	774.3	1.19%	4,481.2	1.34%	67.19%
2030	770.5	1.21%	783.5	1.19%	4,541.3	1.34%	67.28%
2031	779.9	1.22%	793.0	1.21%	4,602.2	1.34%	67.36%
2032	789.2	1.19%	802.4	1.19%	4,664.0	1.34%	67.28%

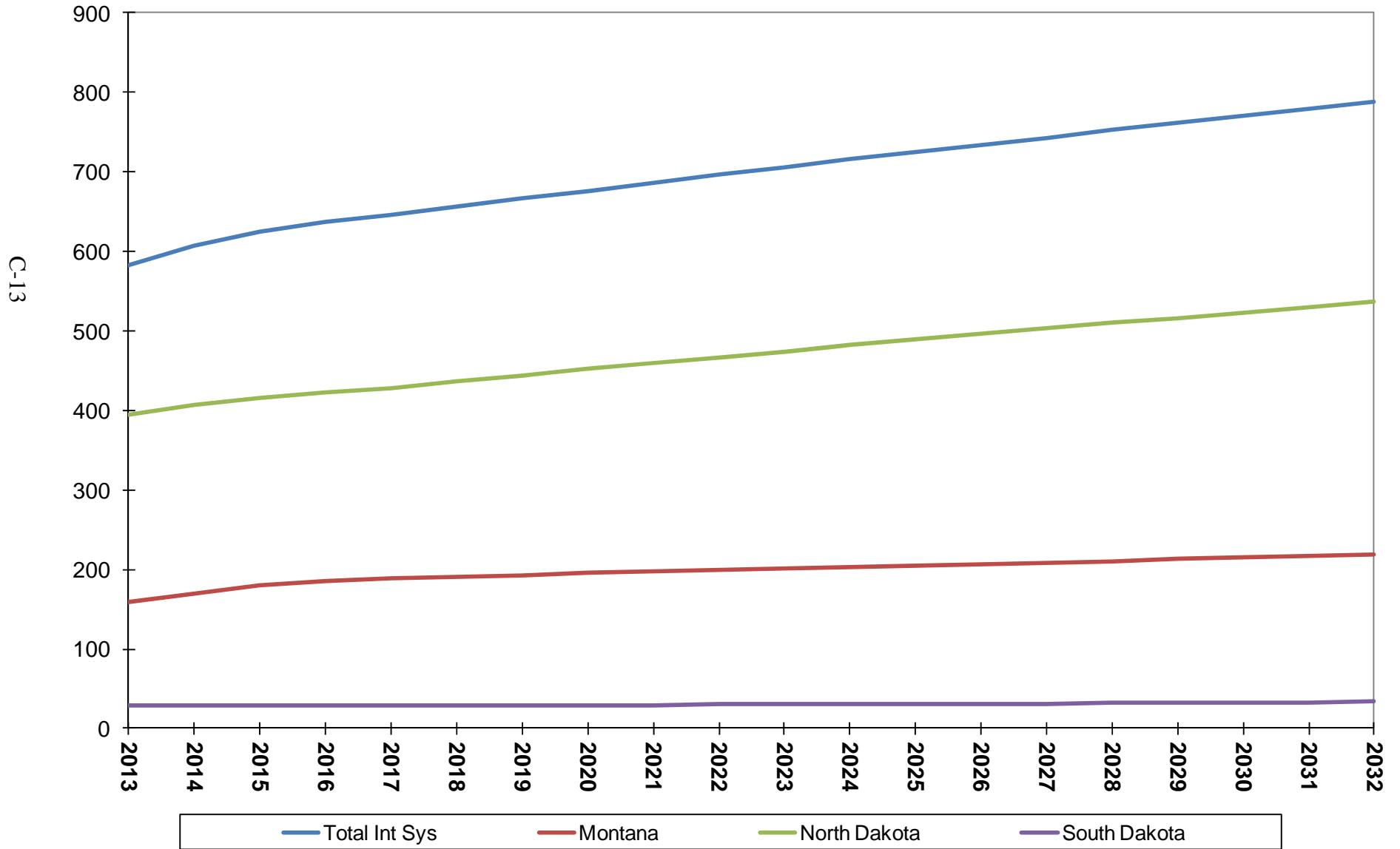
Montana-Dakota Integrated System

Forecast of Annual Energy by State



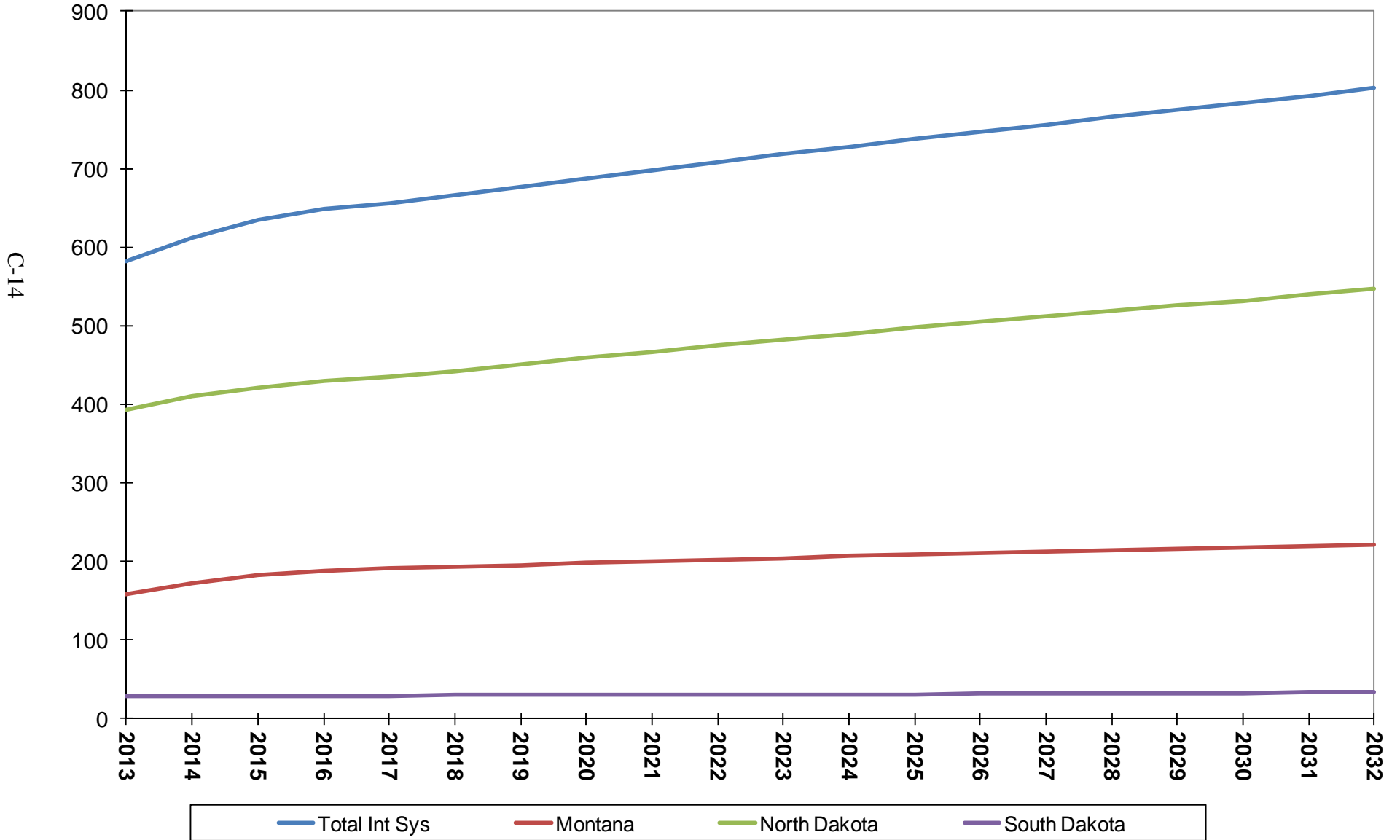
Montana-Dakota Integrated System

Forecast of Summer Peak Demand (Prior to Demand Response) by State



Montana-Dakota Integrated System

Forecast of Winter Peak Demand by State



APPENDIX D

Monthly Forecasts - Montana (2013-2022)

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2013

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	959.4	914.9	776.4	677.4	701.6	712.2	1,037.5	875.0	767.0	672.9	825.9	975.0	9,896.3
# of Residential Customers	19,654	19,653	19,639	19,580	19,589	19,598	19,614	19,622	19,634	19,651	19,677	19,685	19,633
Total Residential Sales - MWh	18,856	17,980	15,248	13,263	13,743	13,958	20,349	17,169	15,060	13,223	16,252	19,193	194,294
Use per Small Comm & Ind Customer - kWh	2,261.3	2,265.3	2,018.1	1,828.9	1,959.2	1,833.9	2,485.1	2,191.8	2,079.2	1,855.7	2,043.1	2,286.3	25,106.7
# of Small Comm & Ind Customers	5,129	5,127	5,131	5,177	5,242	5,269	5,281	5,288	5,276	5,226	5,199	5,187	5,211
Total Small Comm & Ind Sales - MWh	11,598	11,614	10,355	9,468	10,270	9,663	13,124	11,590	10,970	9,698	10,622	11,859	130,831
Large Comm & Ind Sales	39,909	38,518	38,100	39,151	38,587	36,299	39,054	37,340	40,419	41,477	41,339	46,223	476,416
Total Sales (Residential, SC&I and LC&I)	70,363	68,112	63,703	61,882	62,600	59,920	72,527	66,099	66,449	64,398	68,213	77,275	801,541
Other Public Sales	514	569	466	500	609	647	908	763	707	505	511	537	7,236
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	71,522	69,274	64,784	62,984	63,823	61,139	74,037	67,465	67,746	65,530	69,337	78,419	816,060
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	71,562	69,310	64,816	63,013	63,850	61,165	74,070	67,495	67,772	65,555	69,366	78,453	816,427
Total Requirements (Energy + Losses)	77,236	74,806	69,955	68,009	68,913	66,015	79,943	72,847	73,146	70,753	74,866	84,674	881,163
# of Large Comm & Ind Customers	291	291	291	294	298	300	301	301	300	297	295	294	296
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	140.1	134.1	123.6	106.9	105.5	146.5	158.9	152.0	132.2	115.1	136.0	158.8	158.9

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2014

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	963.5	918.8	779.7	680.3	704.6	715.3	1,041.9	878.7	770.3	675.8	829.5	977.9	9,937.5
# of Residential Customers	20,055	20,054	20,039	19,979	19,988	19,997	20,014	20,022	20,034	20,051	20,077	20,086	20,033
Total Residential Sales - MWh	19,323	18,425	15,625	13,591	14,083	14,303	20,853	17,594	15,433	13,550	16,654	19,643	199,077
Use per Small Comm & Ind Customer - kWh	2,292.4	2,296.5	2,045.9	1,854.2	1,986.3	1,859.5	2,519.5	2,222.1	2,108.0	1,881.6	2,071.2	2,313.7	25,450.1
# of Small Comm & Ind Customers	5,266	5,264	5,268	5,315	5,382	5,409	5,422	5,429	5,417	5,365	5,338	5,326	5,350
Total Small Comm & Ind Sales - MWh	12,072	12,089	10,778	9,855	10,690	10,058	13,661	12,064	11,419	10,095	11,056	12,323	136,160
Large Comm & Ind Sales	42,952	41,303	41,122	42,104	41,611	39,222	47,036	45,298	48,181	49,494	49,114	54,272	541,709
Total Sales (Residential, SC&I and LC&I)	74,347	71,817	67,525	65,550	66,384	63,583	81,550	74,956	75,033	73,139	76,824	86,238	876,946
Other Public Sales	514	569	466	500	609	647	908	763	707	506	511	537	7,237
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	75,506	72,979	68,606	66,652	67,607	64,802	83,060	76,322	76,330	74,272	77,948	87,382	891,466
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	75,546	73,015	68,638	66,681	67,634	64,828	83,093	76,352	76,356	74,297	77,977	87,416	891,833
Total Requirements (Energy + Losses)	81,536	78,804	74,080	71,968	72,997	69,968	89,681	82,406	82,410	80,188	84,160	94,347	962,545
# of Large Comm & Ind Customers	299	299	299	302	306	308	309	309	308	305	303	302	304
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	148.3	142.0	130.8	113.2	113.2	157.1	170.4	163.0	141.8	123.4	147.3	172.0	172.0

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2015

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	968.3	923.3	783.6	683.7	708.1	718.9	1,047.1	883.1	774.1	679.1	833.6	982.7	9,986.9
# of Residential Customers	20,405	20,404	20,390	20,328	20,337	20,346	20,363	20,372	20,384	20,401	20,428	20,437	20,383
Total Residential Sales - MWh	19,759	18,840	15,978	13,898	14,401	14,626	21,323	17,991	15,780	13,855	17,029	20,083	203,563
Use per Small Comm & Ind Customer - kWh	2,323.1	2,327.1	2,073.2	1,878.6	2,012.9	1,884.1	2,553.1	2,251.7	2,136.1	1,906.4	2,098.6	2,344.2	25,788.0
# of Small Comm & Ind Customers	5,392	5,390	5,394	5,443	5,510	5,539	5,552	5,559	5,546	5,494	5,466	5,453	5,478
Total Small Comm & Ind Sales - MWh	12,526	12,543	11,183	10,225	11,091	10,436	14,175	12,517	11,847	10,474	11,471	12,783	141,271
Large Comm & Ind Sales	48,405	46,263	46,558	47,389	47,050	44,489	50,508	48,748	51,572	52,996	52,516	57,823	594,317
Total Sales (Residential, SC&I and LC&I)	80,690	77,646	73,719	71,512	72,542	69,551	86,006	79,256	79,199	77,325	81,016	90,689	939,151
Other Public Sales	514	570	467	500	609	647	908	763	707	506	511	537	7,239
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	81,849	78,809	74,801	72,614	73,765	70,770	87,516	80,622	80,496	78,458	82,140	91,833	953,673
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	81,889	78,845	74,833	72,643	73,792	70,796	87,549	80,652	80,522	78,483	82,169	91,867	954,040
Total Requirements (Energy + Losses)	88,382	85,097	80,767	78,403	79,643	76,409	94,491	87,047	86,907	84,706	88,684	99,151	1,029,687
# of Large Comm & Ind Customers	305	306	306	309	313	315	316	316	315	312	310	309	311
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	160.6	153.8	141.7	122.6	119.8	166.4	180.5	172.6	150.1	130.7	156.7	183.0	183.0

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2016

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	973.3	928.0	787.6	687.1	711.6	722.5	1,052.4	887.6	778.1	682.5	837.9	986.0	10,035.7
# of Residential Customers	20,755	20,754	20,740	20,677	20,686	20,696	20,713	20,722	20,734	20,752	20,779	20,788	20,733
Total Residential Sales - MWh	20,200	19,260	16,334	14,208	14,721	14,952	21,798	18,392	16,133	14,164	17,410	20,498	208,070
Use per Small Comm & Ind Customer - kWh	2,354.0	2,358.6	2,100.9	1,903.8	2,039.7	1,909.3	2,587.0	2,281.7	2,164.5	1,932.1	2,126.9	2,371.3	26,128.8
# of Small Comm & Ind Customers	5,519	5,516	5,521	5,571	5,640	5,669	5,683	5,690	5,677	5,623	5,594	5,581	5,607
Total Small Comm & Ind Sales - MWh	12,992	13,010	11,599	10,606	11,504	10,824	14,702	12,983	12,288	10,864	11,898	13,234	146,504
Large Comm & Ind Sales	51,885	49,439	50,021	50,764	50,512	47,845	51,014	49,231	52,093	53,533	53,049	58,410	617,796
Total Sales (Residential, SC&I and LC&I)	85,077	81,709	77,954	75,578	76,737	73,621	87,514	80,606	80,514	78,561	82,357	92,142	972,370
Other Public Sales	514	570	467	500	609	648	909	763	707	506	511	537	7,241
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	86,236	82,872	79,036	76,680	77,960	74,841	89,025	81,972	81,811	79,694	83,481	93,286	986,894
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	86,276	82,908	79,068	76,709	77,987	74,867	89,058	82,002	81,837	79,719	83,510	93,320	987,261
Total Requirements (Energy + Losses)	93,117	89,482	85,337	82,791	84,171	80,803	96,119	88,504	88,326	86,040	90,132	100,719	1,065,541
# of Large Comm & Ind Customers	312	312	313	316	320	322	323	323	322	319	317	316	318
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	170.9	163.6	150.8	130.5	123.3	171.2	185.7	177.6	154.5	134.5	161.5	188.7	188.7

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**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2017

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	978.1	932.6	791.5	690.5	715.2	726.1	1,057.6	892.0	782.0	686.0	842.0	990.8	10,085.5
# of Residential Customers	21,056	21,055	21,040	20,977	20,986	20,995	21,013	21,021	21,034	21,052	21,080	21,089	21,033
Total Residential Sales - MWh	20,594	19,636	16,653	14,485	15,009	15,244	22,224	18,751	16,448	14,441	17,749	20,896	212,130
Use per Small Comm & Ind Customer - kWh	2,383.4	2,387.4	2,127.0	1,927.4	2,065.0	1,933.1	2,619.4	2,309.9	2,191.7	1,956.1	2,153.4	2,400.1	26,452.8
# of Small Comm & Ind Customers	5,634	5,632	5,636	5,687	5,758	5,787	5,801	5,809	5,795	5,740	5,711	5,698	5,724
Total Small Comm & Ind Sales - MWh	13,428	13,446	11,988	10,961	11,890	11,187	15,195	13,418	12,701	11,228	12,298	13,676	151,416
Large Comm & Ind Sales	52,399	49,936	50,516	51,268	51,010	48,330	51,522	49,718	52,617	54,073	53,586	59,002	623,977
Total Sales (Residential, SC&I and LC&I)	86,421	83,018	79,157	76,714	77,909	74,761	88,941	81,887	81,766	79,742	83,633	93,574	987,523
Other Public Sales	514	570	467	500	609	648	909	763	707	506	511	538	7,242
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	87,580	84,181	80,239	77,816	79,132	75,981	90,452	83,253	83,063	80,875	84,757	94,719	1,002,048
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	87,620	84,217	80,271	77,845	79,159	76,007	90,485	83,283	83,089	80,900	84,786	94,753	1,002,415
Total Requirements (Energy + Losses)	94,567	90,895	86,636	84,017	85,436	82,034	97,660	89,887	89,677	87,315	91,509	102,266	1,081,899
# of Large Comm & Ind Customers	319	319	320	323	327	329	330	330	329	326	324	323	325
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	176.2	168.7	155.4	134.5	125.1	173.7	188.4	180.2	156.8	136.4	163.8	191.3	191.3

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2018

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	983.0	937.3	795.5	694.0	718.8	729.7	1,063.0	896.5	785.9	689.4	846.3	994.3	10,135.0
# of Residential Customers	21,356	21,355	21,340	21,276	21,285	21,295	21,312	21,321	21,334	21,352	21,380	21,390	21,333
Total Residential Sales - MWh	20,993	20,017	16,976	14,765	15,300	15,539	22,655	19,115	16,766	14,721	18,093	21,269	216,209
Use per Small Comm & Ind Customer - kWh	2,413.3	2,417.4	2,153.9	1,951.7	2,090.7	1,957.2	2,652.0	2,338.7	2,219.0	1,980.4	2,180.2	2,426.0	26,779.4
# of Small Comm & Ind Customers	5,749	5,747	5,751	5,803	5,876	5,906	5,920	5,928	5,914	5,858	5,828	5,814	5,841
Total Small Comm & Ind Sales - MWh	13,874	13,893	12,387	11,326	12,285	11,559	15,700	13,864	13,123	11,601	12,706	14,105	156,423
Large Comm & Ind Sales	52,916	50,438	51,016	51,776	51,511	48,819	52,035	50,209	53,146	54,617	54,125	59,597	630,205
Total Sales (Residential, SC&I and LC&I)	87,783	84,348	80,379	77,867	79,096	75,917	90,390	83,188	83,035	80,939	84,924	94,971	1,002,837
Other Public Sales	515	570	467	500	609	648	909	763	707	506	511	538	7,243
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	88,943	85,511	81,461	78,969	80,319	77,137	91,901	84,554	84,332	82,072	86,048	96,116	1,017,363
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	88,983	85,547	81,493	78,998	80,346	77,163	91,934	84,584	84,358	82,097	86,077	96,150	1,017,730
Total Requirements (Energy + Losses)	96,038	92,330	87,955	85,262	86,717	83,281	99,223	91,291	91,047	88,606	92,902	103,774	1,098,426
# of Large Comm & Ind Customers	325	325	326	329	333	335	337	337	335	332	330	329	331
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	178.6	171.0	157.6	136.4	126.6	175.8	190.7	182.4	158.7	138.1	165.8	193.7	193.7

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2019

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	988.0	942.1	799.5	697.5	722.4	733.4	1,068.3	901.0	789.8	692.9	850.5	999.3	10,185.8
# of Residential Customers	21,606	21,605	21,590	21,525	21,534	21,544	21,562	21,571	21,584	21,602	21,631	21,640	21,583
Total Residential Sales - MWh	21,346	20,353	17,261	15,014	15,557	15,800	23,035	19,436	17,048	14,968	18,397	21,624	219,839
Use per Small Comm & Ind Customer - kWh	2,441.6	2,445.8	2,179.0	1,974.3	2,115.4	1,979.9	2,683.0	2,366.3	2,244.9	2,003.5	2,205.6	2,453.8	27,091.8
# of Small Comm & Ind Customers	5,852	5,850	5,854	5,908	5,981	6,012	6,026	6,034	6,020	5,963	5,933	5,919	5,946
Total Small Comm & Ind Sales - MWh	14,288	14,308	12,756	11,664	12,652	11,903	16,168	14,278	13,514	11,947	13,086	14,524	161,088
Large Comm & Ind Sales	53,437	50,943	51,518	52,289	52,016	49,310	52,550	50,701	53,677	55,165	54,669	60,197	636,472
Total Sales (Residential, SC&I and LC&I)	89,071	85,604	81,535	78,967	80,225	77,013	91,753	84,415	84,239	82,080	86,152	96,345	1,017,399
Other Public Sales	515	570	467	500	609	648	909	764	708	506	511	538	7,245
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	90,231	86,767	82,617	80,069	81,448	78,233	93,264	85,782	85,537	83,213	87,276	97,490	1,031,927
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	90,271	86,803	82,649	80,098	81,475	78,259	93,297	85,812	85,563	83,238	87,305	97,524	1,032,294
Total Requirements (Energy + Losses)	97,429	93,686	89,202	86,449	87,935	84,464	100,695	92,616	92,347	89,838	94,227	105,257	1,114,145
# of Large Comm & Ind Customers	331	331	332	335	339	341	343	343	341	338	336	335	337
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	180.9	173.2	159.6	138.1	128.1	177.8	192.9	184.5	160.5	139.7	167.8	196.0	196.0

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2020

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	992.8	946.7	803.5	700.9	726.0	737.0	1,073.6	905.5	793.8	696.3	854.8	1,002.8	10,234.9
# of Residential Customers	21,857	21,856	21,840	21,775	21,784	21,794	21,812	21,821	21,834	21,853	21,881	21,891	21,833
Total Residential Sales - MWh	21,700	20,691	17,548	15,263	15,815	16,063	23,418	19,759	17,332	15,217	18,703	21,952	223,461
Use per Small Comm & Ind Customer - kWh	2,469.8	2,474.0	2,203.7	1,997.0	2,139.5	2,002.8	2,713.7	2,393.4	2,270.9	2,026.7	2,231.2	2,478.1	27,399.6
# of Small Comm & Ind Customers	5,956	5,954	5,959	6,013	6,088	6,119	6,134	6,142	6,127	6,069	6,038	6,024	6,052
Total Small Comm & Ind Sales - MWh	14,710	14,730	13,132	12,008	13,025	12,255	16,646	14,700	13,914	12,300	13,472	14,928	165,820
Large Comm & Ind Sales	53,962	51,451	52,025	52,804	52,524	49,803	53,069	51,198	54,212	55,716	55,217	60,801	642,782
Total Sales (Residential, SC&I and LC&I)	90,372	86,872	82,705	80,075	81,364	78,121	93,133	85,657	85,458	83,233	87,392	97,681	1,032,063
Other Public Sales	515	570	467	500	610	648	909	764	708	506	511	538	7,246
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	91,532	88,035	83,787	81,177	82,588	79,341	94,644	87,024	86,756	84,366	88,516	98,826	1,046,592
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	91,572	88,071	83,819	81,206	82,615	79,367	94,677	87,054	86,782	84,391	88,545	98,860	1,046,959
Total Requirements (Energy + Losses)	98,833	95,054	90,465	87,645	89,166	85,660	102,184	93,957	93,663	91,082	95,566	106,699	1,129,974
# of Large Comm & Ind Customers	337	337	338	341	345	347	349	349	347	344	342	341	343
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	183.0	175.3	161.5	139.7	129.6	179.9	195.2	186.6	162.4	141.3	169.9	198.4	198.4

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2021

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	997.8	951.5	807.5	704.5	729.7	740.7	1,079.0	910.0	797.8	699.8	859.0	1,007.8	10,286.3
# of Residential Customers	22,057	22,056	22,040	21,974	21,983	21,994	22,012	22,021	22,034	22,053	22,082	22,091	22,033
Total Residential Sales - MWh	22,009	20,986	17,798	15,480	16,041	16,291	23,751	20,040	17,578	15,433	18,969	22,264	226,640
Use per Small Comm & Ind Customer - kWh	2,496.4	2,500.7	2,227.9	2,018.8	2,162.9	2,024.5	2,743.1	2,419.3	2,295.1	2,048.8	2,255.3	2,504.3	27,696.1
# of Small Comm & Ind Customers	6,048	6,046	6,050	6,105	6,181	6,213	6,228	6,236	6,222	6,162	6,131	6,117	6,145
Total Small Comm & Ind Sales - MWh	15,098	15,119	13,479	12,325	13,369	12,578	17,084	15,087	14,280	12,625	13,827	15,319	170,190
Large Comm & Ind Sales	54,489	51,963	52,535	53,324	53,035	50,300	53,593	51,698	54,752	56,272	55,768	61,409	649,138
Total Sales (Residential, SC&I and LC&I)	91,596	88,068	83,812	81,129	82,445	79,169	94,428	86,825	86,610	84,330	88,564	98,992	1,045,968
Other Public Sales	515	570	467	500	610	648	909	764	708	506	511	538	7,246
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	92,756	89,231	84,894	82,231	83,669	80,389	95,939	88,192	87,908	85,463	89,688	100,137	1,060,497
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	92,796	89,267	84,926	82,260	83,696	80,415	95,972	88,222	87,934	85,488	89,717	100,171	1,060,864
Total Requirements (Energy + Losses)	100,154	96,345	91,660	88,782	90,332	86,791	103,582	95,217	94,906	92,266	96,831	108,114	1,144,980
# of Large Comm & Ind Customers	343	343	344	347	351	353	355	355	353	350	348	347	349
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	185.3	177.4	163.4	141.4	131.0	181.9	197.3	188.6	164.1	142.8	171.7	200.6	200.6

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

MONTANA YEAR 2022

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,002.9	956.3	811.6	708.0	733.3	744.5	1,084.4	914.6	801.8	703.3	863.4	1,010.1	10,335.4
# of Residential Customers	22,257	22,256	22,240	22,173	22,183	22,193	22,212	22,221	22,234	22,253	22,282	22,292	22,233
Total Residential Sales - MWh	22,321	21,283	18,050	15,699	16,267	16,522	24,087	20,323	17,827	15,651	19,238	22,518	229,786
Use per Small Comm & Ind Customer - kWh	2,523.3	2,527.9	2,252.0	2,040.5	2,186.1	2,046.5	2,773.0	2,445.4	2,320.1	2,070.8	2,279.7	2,523.3	27,987.7
# of Small Comm & Ind Customers	6,140	6,137	6,142	6,198	6,275	6,307	6,322	6,331	6,316	6,256	6,224	6,210	6,238
Total Small Comm & Ind Sales - MWh	15,493	15,514	13,832	12,647	13,718	12,907	17,531	15,482	14,654	12,955	14,189	15,670	174,592
Large Comm & Ind Sales	55,022	52,478	53,047	53,846	53,551	50,801	54,119	52,200	55,294	56,830	56,323	62,022	655,533
Total Sales (Residential, SC&I and LC&I)	92,836	89,275	84,929	82,192	83,536	80,230	95,737	88,005	87,775	85,436	89,750	100,210	1,059,911
Other Public Sales	515	570	467	500	610	648	909	764	708	506	511	538	7,246
Street & Highway Lighting Sales	626	573	599	587	598	559	586	590	575	614	596	588	7,091
Interdepartmental Sales	19	20	16	15	16	13	16	13	15	13	17	19	192
Total Billed Sales - MWh	93,996	90,438	86,011	83,294	84,760	81,450	97,248	89,372	89,073	86,569	90,874	101,355	1,074,440
Company Use	40	36	32	29	27	26	33	30	26	25	29	34	367
Total Energy	94,036	90,474	86,043	83,323	84,787	81,476	97,281	89,402	89,099	86,594	90,903	101,389	1,074,807
Total Requirements (Energy + Losses)	101,492	97,648	92,865	89,930	91,510	87,936	104,994	96,491	96,164	93,460	98,111	109,428	1,160,029
# of Large Comm & Ind Customers	348	348	348	352	356	358	360	360	358	355	353	352	354
# of Other Public Customers	103	103	103	106	109	109	110	109	107	106	104	104	106
# of Street & Highway Lighting Customers	91	90	89	89	88	88	82	83	83	83	83	83	86
Peak Demand Net of Energy Efficiency Progs	187.3	179.4	165.2	143.0	132.4	183.8	199.4	190.7	165.9	144.4	173.6	202.8	202.8

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APPENDIX E

Monthly Forecasts - North Dakota (2013-2022)

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2013

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,065.5	991.9	873.2	748.1	735.3	767.2	1,036.3	919.0	792.5	740.2	900.6	1,067.9	10,637.8
# of Residential Customers	69,322	69,352	69,375	69,382	69,457	69,552	69,624	69,713	69,752	69,826	69,884	69,911	69,596
Total Residential Sales - MWh	73,860	68,788	60,576	51,908	51,075	53,361	72,149	64,069	55,280	51,682	62,940	74,658	740,346
Use per Small Comm & Ind Customer - kWh	4,362.2	4,237.7	3,934.6	3,550.0	3,628.3	3,566.5	4,364.4	4,172.4	3,868.1	3,763.1	4,153.2	4,406.8	48,004.0
# of Small Comm & Ind Customers	11,459	11,453	11,460	11,537	11,634	11,699	11,710	11,749	11,744	11,681	11,656	11,669	11,621
Total Small Comm & Ind Sales - MWh	49,987	48,534	45,091	40,956	42,212	41,725	51,107	49,022	45,427	43,957	48,410	51,423	557,851
Large Comm & Ind Sales	54,898	54,254	52,910	52,118	53,423	53,338	60,838	57,700	56,526	53,856	53,417	57,970	661,248
Total Sales (Residential, SC&I and LC&I)	178,745	171,576	158,577	144,982	146,710	148,424	184,094	170,791	157,233	149,495	164,767	184,051	1,959,445
Other Public Sales	2,954	2,884	2,893	2,729	3,084	3,326	3,850	3,652	3,104	2,821	2,755	2,921	36,973
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	183,557	176,187	163,182	149,341	151,409	153,233	189,513	176,048	161,984	154,076	169,369	188,814	2,016,713
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	184,200	176,764	163,776	149,931	152,021	153,852	190,192	176,735	162,582	154,678	169,960	189,421	2,024,112
Total Requirements (Energy + Losses)	198,805	190,780	176,762	161,819	164,075	166,051	205,272	190,748	175,473	166,942	183,436	204,440	2,184,603
# of Large Comm & Ind Customers	608	610	610	613	613	613	613	605	605	606	606	605	609
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	343.9	331.9	302.9	272.0	279.3	350.8	393.9	368.7	312.6	251.5	345.7	393.7	393.9

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2014

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,070.0	996.1	876.9	751.4	738.5	770.5	1,040.7	923.0	795.9	743.3	904.5	1,071.1	10,682.2
# of Residential Customers	70,518	70,548	70,572	70,578	70,655	70,752	70,824	70,915	70,955	71,030	71,089	71,117	70,796
Total Residential Sales - MWh	75,457	70,276	61,886	53,031	52,180	54,515	73,709	65,454	56,476	52,799	64,301	76,172	756,256
Use per Small Comm & Ind Customer - kWh	4,408.2	4,282.2	3,976.1	3,587.5	3,667.0	3,604.3	4,410.8	4,216.4	3,909.2	3,803.1	4,197.3	4,441.4	48,500.0
# of Small Comm & Ind Customers	11,923	11,917	11,924	12,004	12,104	12,172	12,183	12,225	12,219	12,153	12,127	12,141	12,091
Total Small Comm & Ind Sales - MWh	52,559	51,031	47,411	43,064	44,385	43,872	53,737	51,545	47,766	46,219	50,901	53,923	586,413
Large Comm & Ind Sales	60,258	59,552	58,018	57,163	58,612	58,537	66,817	63,354	62,031	59,079	58,596	61,543	723,560
Total Sales (Residential, SC&I and LC&I)	188,274	180,859	167,315	153,258	155,177	156,924	194,263	180,353	166,273	158,097	173,798	191,638	2,066,229
Other Public Sales	2,975	2,904	2,913	2,749	3,106	3,349	3,877	3,678	3,125	2,840	2,774	2,941	37,231
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	193,107	185,490	171,940	157,637	159,898	161,756	199,709	185,636	171,045	162,697	178,419	196,421	2,123,755
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	193,750	186,067	172,534	158,227	160,510	162,375	200,388	186,323	171,643	163,299	179,010	197,028	2,131,154
Total Requirements (Energy + Losses)	209,112	200,820	186,214	170,773	173,237	175,250	216,277	201,097	185,253	176,247	193,204	212,650	2,300,134
# of Large Comm & Ind Customers	637	639	639	642	643	642	642	634	634	635	635	634	638
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	374.5	361.4	329.9	296.2	288.7	362.7	407.2	381.1	323.2	260.0	360.9	411.0	411.0

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2015

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,075.4	1,001.2	881.3	755.2	742.2	774.4	1,045.9	927.6	799.9	747.1	909.1	1,075.5	10,735.0
# of Residential Customers	71,514	71,544	71,568	71,575	71,653	71,751	71,825	71,916	71,957	72,033	72,093	72,121	71,796
Total Residential Sales - MWh	76,908	71,627	63,076	54,051	53,183	55,563	75,125	66,712	57,561	53,814	65,538	77,569	770,727
Use per Small Comm & Ind Customer - kWh	4,460.0	4,332.5	4,022.9	3,629.6	3,709.7	3,646.4	4,462.2	4,266.0	3,955.0	3,847.4	4,246.3	4,486.5	49,061.0
# of Small Comm & Ind Customers	12,328	12,322	12,329	12,412	12,516	12,586	12,598	12,640	12,634	12,567	12,540	12,554	12,502
Total Small Comm & Ind Sales - MWh	54,983	53,385	49,598	45,051	46,431	45,894	56,215	53,922	49,968	48,350	53,248	56,324	613,369
Large Comm & Ind Sales	62,271	61,517	59,965	59,080	60,585	60,503	69,039	65,474	64,096	61,062	60,553	63,309	747,454
Total Sales (Residential, SC&I and LC&I)	194,162	186,529	172,639	158,182	160,199	161,960	200,379	186,108	171,625	163,226	179,339	197,202	2,131,550
Other Public Sales	2,995	2,924	2,934	2,768	3,128	3,373	3,904	3,703	3,147	2,860	2,793	2,962	37,491
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	199,015	191,180	177,285	162,580	164,942	166,816	205,852	191,416	176,419	167,846	183,979	202,006	2,189,336
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	199,658	191,757	177,879	163,170	165,554	167,435	206,531	192,103	177,017	168,448	184,570	202,613	2,196,735
Total Requirements (Energy + Losses)	215,489	206,961	191,983	176,108	178,681	180,711	222,907	207,335	191,053	181,804	199,205	218,678	2,370,915
# of Large Comm & Ind Customers	663	665	665	668	669	668	669	660	660	661	660	660	664
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	390.9	377.3	344.4	309.2	294.6	370.1	415.5	388.9	329.8	265.3	370.0	421.4	421.4

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2016

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,080.8	1,006.2	885.8	759.0	746.0	778.3	1,051.2	932.3	804.0	750.8	913.6	1,080.8	10,788.8
# of Residential Customers	72,410	72,441	72,465	72,472	72,551	72,650	72,725	72,818	72,859	72,936	72,997	73,025	72,696
Total Residential Sales - MWh	78,263	72,889	64,187	55,003	54,120	56,542	76,449	67,888	58,576	54,763	66,693	78,928	784,301
Use per Small Comm & Ind Customer - kWh	4,538.5	4,408.9	4,093.6	3,693.5	3,775.2	3,710.7	4,541.0	4,340.9	4,024.5	3,915.4	4,321.4	4,564.7	49,924.7
# of Small Comm & Ind Customers	12,637	12,630	12,638	12,723	12,829	12,901	12,913	12,957	12,951	12,881	12,853	12,868	12,815
Total Small Comm & Ind Sales - MWh	57,353	55,685	51,735	46,992	48,432	47,872	58,638	56,245	52,121	50,434	55,543	58,739	639,789
Large Comm & Ind Sales	63,425	62,664	61,081	60,182	61,720	61,640	70,342	66,708	65,303	62,204	61,680	63,128	760,077
Total Sales (Residential, SC&I and LC&I)	199,041	191,238	177,003	162,177	164,272	166,054	205,429	190,841	176,000	167,401	183,916	200,795	2,184,167
Other Public Sales	3,016	2,945	2,953	2,787	3,150	3,396	3,931	3,729	3,169	2,880	2,813	2,982	37,751
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	203,915	195,910	181,668	166,594	169,037	170,933	210,929	196,175	180,816	172,041	188,576	205,619	2,242,213
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	204,558	196,487	182,262	167,184	169,649	171,552	211,608	196,862	181,414	172,643	189,167	206,226	2,249,612
Total Requirements (Energy + Losses)	220,777	212,066	196,714	180,440	183,100	185,154	228,386	212,471	195,798	186,332	204,166	222,578	2,427,982
# of Large Comm & Ind Customers	683	685	686	688	689	688	689	680	680	681	680	680	684
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	400.8	386.8	353.1	317.0	300.1	376.9	423.2	396.1	335.9	270.2	377.6	430.0	430.0

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**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2017

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,086.2	1,011.2	890.2	762.7	749.7	782.2	1,056.5	937.0	808.0	754.6	918.2	1,085.3	10,841.8
# of Residential Customers	73,307	73,338	73,363	73,370	73,449	73,550	73,625	73,719	73,761	73,839	73,901	73,929	73,596
Total Residential Sales - MWh	79,628	74,160	65,307	55,962	55,063	57,528	77,783	69,072	59,597	55,718	67,856	80,237	797,911
Use per Small Comm & Ind Customer - kWh	4,617.8	4,486.0	4,165.2	3,758.1	3,841.2	3,775.5	4,620.3	4,416.8	4,094.8	3,983.5	4,396.8	4,637.6	50,789.7
# of Small Comm & Ind Customers	12,950	12,943	12,951	13,038	13,147	13,221	13,233	13,278	13,272	13,201	13,172	13,187	13,133
Total Small Comm & Ind Sales - MWh	59,800	58,062	53,944	48,998	50,500	49,916	61,141	58,646	54,346	52,586	57,914	61,156	667,009
Large Comm & Ind Sales	61,874	61,188	59,775	59,011	60,718	60,822	69,556	65,932	64,370	61,103	60,367	62,774	747,490
Total Sales (Residential, SC&I and LC&I)	201,302	193,410	179,026	163,971	166,281	168,266	208,480	193,650	178,313	169,407	186,137	204,167	2,212,410
Other Public Sales	3,037	2,965	2,974	2,806	3,171	3,419	3,958	3,754	3,191	2,899	2,832	3,002	38,008
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	206,197	198,102	183,712	168,407	171,067	173,168	214,007	199,009	183,151	174,066	190,816	209,011	2,270,713
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	206,840	198,679	184,306	168,997	171,679	173,787	214,686	199,696	183,749	174,668	191,407	209,618	2,278,112
Total Requirements (Energy + Losses)	223,240	214,432	198,920	182,397	185,291	187,567	231,708	215,530	198,318	188,517	206,584	226,239	2,458,743
# of Large Comm & Ind Customers	703	705	706	708	709	709	709	700	699	701	700	700	704
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	409.0	394.7	360.3	323.5	303.6	381.4	428.2	400.8	339.9	273.4	381.7	434.7	434.7

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2018

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,091.6	1,016.2	894.6	766.5	753.4	786.1	1,061.7	941.6	812.0	758.3	922.8	1,090.7	10,895.7
# of Residential Customers	74,104	74,135	74,160	74,167	74,248	74,349	74,426	74,521	74,563	74,642	74,704	74,733	74,396
Total Residential Sales - MWh	80,894	75,339	66,345	56,852	55,939	58,444	79,019	70,170	60,545	56,604	68,935	81,511	810,597
Use per Small Comm & Ind Customer - kWh	4,693.1	4,559.1	4,233.2	3,819.4	3,903.7	3,837.1	4,695.5	4,489.0	4,161.7	4,048.7	4,468.5	4,712.1	51,617.4
# of Small Comm & Ind Customers	13,249	13,242	13,250	13,339	13,451	13,526	13,539	13,584	13,578	13,505	13,476	13,492	13,436
Total Small Comm & Ind Sales - MWh	62,179	60,371	56,090	50,947	52,509	51,901	63,573	60,978	56,508	54,678	60,217	63,576	693,527
Large Comm & Ind Sales	62,618	61,928	60,502	59,728	61,456	61,563	70,404	66,736	65,157	61,847	61,101	63,534	756,574
Total Sales (Residential, SC&I and LC&I)	205,691	197,638	182,937	167,527	169,904	171,908	212,996	197,884	182,210	173,129	190,253	208,621	2,260,698
Other Public Sales	3,058	2,985	2,994	2,825	3,193	3,443	3,985	3,780	3,212	2,919	2,851	3,023	38,268
Street & Highway Lightings Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	210,607	202,350	187,643	171,982	174,712	176,834	218,550	203,269	187,069	177,808	194,951	213,486	2,319,261
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	211,250	202,927	188,237	172,572	175,324	177,453	219,229	203,956	187,667	178,410	195,542	214,093	2,326,660
Total Requirements (Energy + Losses)	228,000	219,017	203,162	186,255	189,225	191,523	236,612	220,128	202,547	192,556	211,047	231,068	2,511,140
# of Large Comm & Ind Customers	722	724	725	727	728	728	728	719	718	720	719	719	723
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	413.5	399.1	364.3	327.0	309.2	388.3	436.0	408.1	346.1	278.4	388.8	442.8	442.8

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**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2019

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,097.2	1,021.4	899.1	770.4	757.2	790.0	1,067.1	946.4	816.1	762.2	927.4	1,095.3	10,949.9
# of Residential Customers	74,900	74,933	74,958	74,965	75,046	75,149	75,226	75,322	75,365	75,445	75,508	75,537	75,196
Total Residential Sales - MWh	82,177	76,535	67,398	57,754	56,827	59,370	80,273	71,283	61,505	57,502	70,028	82,736	823,388
Use per Small Comm & Ind Customer - kWh	4,768.9	4,632.6	4,301.5	3,881.0	3,966.9	3,899.2	4,771.6	4,561.4	4,228.8	4,114.1	4,540.8	4,781.7	52,444.7
# of Small Comm & Ind Customers	13,552	13,545	13,553	13,644	13,758	13,835	13,848	13,895	13,889	13,814	13,784	13,800	13,743
Total Small Comm & Ind Sales - MWh	64,628	62,749	58,298	52,953	54,577	53,946	66,077	63,381	58,734	56,832	62,590	65,987	720,752
Large Comm & Ind Sales	63,372	62,677	61,237	60,454	62,204	62,313	71,262	67,548	65,952	62,600	61,842	64,303	765,764
Total Sales (Residential, SC&I and LC&I)	210,177	201,961	186,933	171,161	173,608	175,629	217,612	202,212	186,191	176,934	194,460	213,026	2,309,904
Other Public Sales	3,079	3,006	3,015	2,844	3,214	3,466	4,012	3,805	3,234	2,938	2,870	3,043	38,526
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	215,114	206,694	191,660	175,635	178,437	180,578	223,193	207,622	191,072	181,632	199,177	217,911	2,368,725
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	215,757	207,271	192,254	176,225	179,049	181,197	223,872	208,309	191,670	182,234	199,768	218,518	2,376,124
Total Requirements (Energy + Losses)	232,864	223,706	207,498	190,198	193,246	195,564	241,623	224,826	206,868	196,683	215,608	235,844	2,564,528
# of Large Comm & Ind Customers	741	743	744	746	747	747	747	737	737	739	738	738	742
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	421.2	406.5	371.1	333.1	314.8	395.5	444.0	415.6	352.4	283.5	396.1	451.1	451.1

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2020

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,102.6	1,026.5	903.6	774.3	761.0	794.0	1,072.4	951.1	820.2	766.0	932.1	1,100.7	11,004.7
# of Residential Customers	75,598	75,630	75,655	75,663	75,745	75,848	75,926	76,023	76,067	76,147	76,210	76,240	75,896
Total Residential Sales - MWh	83,358	77,634	68,365	58,584	57,643	60,223	81,426	72,307	62,389	58,327	71,034	83,920	835,210
Use per Small Comm & Ind Customer - kWh	4,840.3	4,702.2	4,365.8	3,939.1	4,026.3	3,957.5	4,843.0	4,629.7	4,292.1	4,175.8	4,608.6	4,852.4	53,228.9
# of Small Comm & Ind Customers	13,841	13,833	13,842	13,935	14,051	14,130	14,143	14,191	14,185	14,108	14,078	14,094	14,036
Total Small Comm & Ind Sales - MWh	66,994	65,046	60,432	54,891	56,574	55,920	68,495	65,700	60,883	58,912	64,880	68,390	747,117
Large Comm & Ind Sales	64,136	63,436	61,982	61,190	62,961	63,073	72,131	68,372	66,759	63,362	62,594	65,084	775,080
Total Sales (Residential, SC&I and LC&I)	214,488	206,116	190,779	174,665	177,178	179,216	222,052	206,379	190,031	180,601	198,508	217,394	2,357,407
Other Public Sales	3,099	3,025	3,034	2,863	3,236	3,489	4,039	3,831	3,256	2,958	2,889	3,063	38,782
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	219,445	210,868	195,525	179,158	182,029	184,188	227,660	211,815	194,934	185,319	203,244	222,299	2,416,484
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	220,088	211,445	196,119	179,748	182,641	184,807	228,339	212,502	195,532	185,921	203,835	222,906	2,423,883
Total Requirements (Energy + Losses)	237,539	228,210	211,669	194,000	197,123	199,460	246,444	229,351	211,036	200,663	219,997	240,580	2,616,072
# of Large Comm & Ind Customers	759	761	762	765	766	765	765	755	755	757	756	755	760
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	429.1	414.1	378.0	339.4	320.4	402.4	451.8	422.9	358.6	288.5	403.3	459.3	459.3

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2021

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,108.1	1,031.6	908.2	778.1	764.8	798.0	1,077.8	955.9	824.3	769.8	936.7	1,105.4	11,058.7
# of Residential Customers	76,295	76,328	76,353	76,360	76,443	76,548	76,626	76,724	76,768	76,849	76,913	76,943	76,596
Total Residential Sales - MWh	84,546	78,741	69,340	59,419	58,465	61,082	82,587	73,338	63,278	59,159	72,047	85,050	847,052
Use per Small Comm & Ind Customer - kWh	4,912.5	4,772.0	4,430.7	3,997.6	4,086.0	4,016.4	4,914.8	4,698.6	4,355.9	4,237.7	4,677.1	4,917.9	54,013.0
# of Small Comm & Ind Customers	14,132	14,125	14,134	14,229	14,348	14,428	14,442	14,490	14,484	14,406	14,375	14,391	14,332
Total Small Comm & Ind Sales - MWh	69,423	67,405	62,624	56,882	58,626	57,948	70,979	68,083	63,091	61,048	67,233	70,773	774,115
Large Comm & Ind Sales	64,912	64,208	62,738	61,938	63,729	63,844	73,015	69,208	67,576	64,135	63,357	65,810	784,470
Total Sales (Residential, SC&I and LC&I)	218,881	210,354	194,702	178,239	180,820	182,874	226,581	210,629	193,945	184,342	202,637	221,633	2,405,637
Other Public Sales	3,120	3,046	3,055	2,882	3,258	3,513	4,066	3,856	3,277	2,978	2,909	3,084	39,044
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	223,859	215,127	199,469	182,751	185,693	187,870	232,216	216,090	198,869	189,080	207,393	226,559	2,464,976
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	224,502	215,704	200,063	183,341	186,305	188,489	232,895	216,777	199,467	189,682	207,984	227,166	2,472,375
Total Requirements (Energy + Losses)	242,303	232,807	215,926	197,878	201,077	203,434	251,361	233,965	215,283	204,722	224,475	245,178	2,668,409
# of Large Comm & Ind Customers	778	780	781	784	785	784	784	774	774	775	775	774	779
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	436.9	421.6	384.9	345.5	326.0	409.5	459.7	430.3	364.9	293.5	410.4	467.4	467.4

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

NORTH DAKOTA YEAR 2022

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,113.7	1,036.7	912.7	782.0	768.6	801.9	1,083.1	960.6	828.4	773.6	941.4	1,110.8	11,113.5
# of Residential Customers	76,893	76,926	76,951	76,959	77,042	77,148	77,227	77,325	77,369	77,451	77,516	77,546	77,196
Total Residential Sales - MWh	85,632	79,751	70,230	60,181	59,215	61,865	83,647	74,279	64,090	59,918	72,972	86,141	857,921
Use per Small Comm & Ind Customer - kWh	4,979.8	4,837.7	4,491.7	4,052.7	4,142.3	4,071.6	4,982.5	4,763.3	4,415.9	4,296.1	4,741.4	4,984.5	54,755.4
# of Small Comm & Ind Customers	14,409	14,401	14,410	14,507	14,628	14,710	14,724	14,773	14,767	14,687	14,656	14,673	14,612
Total Small Comm & Ind Sales - MWh	71,754	69,668	64,726	58,792	60,594	59,893	73,362	70,368	65,209	63,097	69,490	73,138	800,091
Large Comm & Ind Sales	65,574	64,862	63,366	62,558	64,367	64,483	73,752	69,904	68,254	64,777	63,995	66,477	792,369
Total Sales (Residential, SC&I and LC&I)	222,960	214,281	198,322	181,531	184,176	186,241	230,761	214,551	197,553	187,792	206,457	225,756	2,450,381
Other Public Sales	3,140	3,066	3,075	2,901	3,279	3,536	4,093	3,882	3,299	2,997	2,928	3,104	39,300
Street & Highway Lighting Sales	1,836	1,705	1,692	1,611	1,597	1,467	1,551	1,589	1,629	1,742	1,826	1,818	20,063
Interdepartmental Sales	22	22	20	19	18	16	18	16	18	18	21	24	232
Total Billed Sales - MWh	227,958	219,074	203,109	186,062	189,070	191,260	236,423	220,038	202,499	192,549	211,232	230,702	2,509,976
Company Use	643	577	594	590	612	619	679	687	598	602	591	607	7,399
Total Energy	228,601	219,651	203,703	186,652	189,682	191,879	237,102	220,725	203,097	193,151	211,823	231,309	2,517,375
Total Requirements (Energy + Losses)	246,727	237,067	219,855	201,452	204,722	207,093	255,902	238,226	219,201	208,466	228,618	249,649	2,716,978
# of Large Comm & Ind Customers	795	797	798	801	802	801	801	791	791	792	792	791	796
# of Other Public Customers	694	694	695	699	704	704	703	703	701	697	692	689	698
# of Street & Highway Lighting Customers	533	530	529	530	531	532	521	523	524	526	527	530	528
Peak Demand Net of Energy Efficiency Progs	444.6	429.1	391.7	351.6	331.1	416.0	467.0	437.1	370.7	298.2	417.1	475.0	475.0

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APPENDIX F

Monthly Forecasts – South Dakota (2013-2022)

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2013

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,114.7	1,036.8	918.8	769.7	752.6	758.7	1,013.7	876.1	793.8	741.0	914.8	1,109.2	10,797.7
# of Residential Customers	6,602	6,599	6,597	6,603	6,621	6,636	6,661	6,659	6,650	6,634	6,610	6,593	6,622
Total Residential Sales - MWh	7,359	6,842	6,061	5,082	4,983	5,035	6,752	5,834	5,279	4,916	6,047	7,313	71,503
Use per Small Comm & Ind Customer - kWh	1,932.4	1,920.6	1,642.7	1,478.0	1,484.9	1,482.4	1,977.0	1,682.0	1,678.5	1,486.6	1,762.2	1,935.0	20,450.7
# of Small Comm & Ind Customers	1,791	1,789	1,791	1,816	1,854	1,870	1,872	1,868	1,860	1,831	1,817	1,814	1,831
Total Small Comm & Ind Sales - MWh	3,461	3,436	2,942	2,684	2,753	2,772	3,701	3,142	3,122	2,722	3,202	3,510	37,447
Large Comm & Ind Sales	2,965	3,472	2,870	2,756	3,167	2,786	3,732	2,871	3,731	3,032	3,487	3,404	38,273
Total Sales (Residential, SC&I and LC&I)	13,785	13,750	11,873	10,522	10,903	10,593	14,185	11,847	12,132	10,670	12,736	14,227	147,223
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,106	14,098	12,191	10,839	11,247	10,934	14,569	12,169	12,495	10,978	13,064	14,555	151,245
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,165	14,146	12,229	10,861	11,267	10,945	14,582	12,184	12,508	10,997	13,096	14,604	151,584
Total Requirements (Energy + Losses)	15,288	15,268	13,199	11,722	12,160	11,813	15,738	13,150	13,500	11,869	14,134	15,762	163,603
# of Large Comm & Ind Customers	102	102	101	104	104	104	104	104	105	105	105	106	104
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	25.7	24.3	26.4	20.3	16.4	24.4	29.5	26.7	21.3	19.7	27.5	29.5	29.5

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2014

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,123.5	1,045.1	925.9	775.7	758.5	764.6	1,021.6	882.9	799.9	746.7	921.8	1,103.2	10,867.2
# of Residential Customers	6,615	6,611	6,610	6,616	6,634	6,649	6,674	6,672	6,663	6,647	6,623	6,606	6,635
Total Residential Sales - MWh	7,432	6,909	6,120	5,132	5,032	5,084	6,818	5,891	5,330	4,963	6,105	7,288	72,104
Use per Small Comm & Ind Customer - kWh	1,949.4	1,938.1	1,656.6	1,491.2	1,497.8	1,495.2	1,994.1	1,696.9	1,692.9	1,499.2	1,776.7	1,951.6	20,628.2
# of Small Comm & Ind Customers	1,797	1,794	1,797	1,822	1,860	1,876	1,878	1,874	1,866	1,837	1,823	1,820	1,837
Total Small Comm & Ind Sales - MWh	3,503	3,477	2,977	2,717	2,786	2,805	3,745	3,180	3,159	2,754	3,239	3,552	37,894
Large Comm & Ind Sales	3,033	3,551	2,936	2,819	3,238	2,849	3,817	2,937	3,815	3,100	3,566	3,485	39,146
Total Sales (Residential, SC&I and LC&I)	13,968	13,937	12,033	10,668	11,056	10,738	14,380	12,008	12,304	10,817	12,910	14,325	149,144
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,289	14,285	12,351	10,985	11,400	11,079	14,764	12,330	12,667	11,125	13,238	14,653	153,166
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,348	14,333	12,389	11,007	11,420	11,090	14,777	12,345	12,680	11,144	13,270	14,702	153,505
Total Requirements (Energy + Losses)	15,486	15,469	13,371	11,880	12,325	11,969	15,949	13,324	13,685	12,028	14,322	15,868	165,676
# of Large Comm & Ind Customers	102	102	101	104	104	104	104	104	105	105	105	106	104
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	25.6	24.1	26.2	20.2	16.3	24.2	29.3	26.6	21.1	19.6	27.5	29.6	29.6

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2015

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,108.4	1,031.0	913.6	765.3	748.3	754.5	1,007.9	871.0	789.3	736.7	909.5	1,073.0	10,706.4
# of Residential Customers	6,625	6,621	6,620	6,626	6,644	6,659	6,684	6,682	6,673	6,657	6,633	6,615	6,645
Total Residential Sales - MWh	7,343	6,826	6,048	5,071	4,972	5,024	6,737	5,820	5,267	4,904	6,033	7,098	71,143
Use per Small Comm & Ind Customer - kWh	1,967.8	1,956.6	1,672.6	1,505.7	1,512.6	1,509.0	2,013.8	1,713.1	1,709.8	1,514.1	1,794.3	1,970.4	20,828.0
# of Small Comm & Ind Customers	1,802	1,799	1,802	1,827	1,865	1,882	1,883	1,879	1,871	1,842	1,828	1,825	1,842
Total Small Comm & Ind Sales - MWh	3,546	3,520	3,014	2,751	2,821	2,840	3,792	3,219	3,199	2,789	3,280	3,596	38,367
Large Comm & Ind Sales	3,107	3,638	3,008	2,888	3,318	2,919	3,911	3,009	3,909	3,177	3,654	3,571	40,109
Total Sales (Residential, SC&I and LC&I)	13,996	13,984	12,070	10,710	11,111	10,783	14,440	12,048	12,375	10,870	12,967	14,265	149,619
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,317	14,332	12,388	11,027	11,455	11,124	14,824	12,370	12,738	11,178	13,295	14,593	153,641
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,376	14,380	12,426	11,049	11,475	11,135	14,837	12,385	12,751	11,197	13,327	14,642	153,980
Total Requirements (Energy + Losses)	15,516	15,520	13,411	11,925	12,385	12,018	16,013	13,367	13,762	12,085	14,384	15,803	166,189
# of Large Comm & Ind Customers	103	103	102	105	105	105	105	105	106	106	106	107	105
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	25.7	24.2	26.3	20.3	16.2	24.0	29.1	26.4	21.0	19.5	27.5	29.5	29.5

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2016

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,067.1	992.6	879.5	736.7	720.5	726.3	970.3	838.6	759.8	709.2	875.7	1,059.2	10,333.3
# of Residential Customers	6,635	6,631	6,630	6,636	6,654	6,669	6,694	6,692	6,683	6,667	6,643	6,625	6,655
Total Residential Sales - MWh	7,080	6,582	5,831	4,889	4,794	4,844	6,495	5,612	5,078	4,728	5,817	7,017	68,767
Use per Small Comm & Ind Customer - kWh	1,987.3	1,976.2	1,689.8	1,520.5	1,527.6	1,524.4	2,033.4	1,730.2	1,726.4	1,528.7	1,811.7	1,989.6	21,033.6
# of Small Comm & Ind Customers	1,806	1,803	1,805	1,831	1,869	1,886	1,887	1,883	1,875	1,846	1,832	1,829	1,846
Total Small Comm & Ind Sales - MWh	3,589	3,563	3,050	2,784	2,855	2,875	3,837	3,258	3,237	2,822	3,319	3,639	38,828
Large Comm & Ind Sales	3,183	3,727	3,081	2,959	3,399	2,990	4,006	3,083	4,004	3,254	3,743	3,658	41,087
Total Sales (Residential, SC&I and LC&I)	13,852	13,872	11,962	10,632	11,048	10,709	14,338	11,953	12,319	10,804	12,879	14,314	148,682
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,173	14,220	12,280	10,949	11,392	11,050	14,722	12,275	12,682	11,112	13,207	14,642	152,704
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,232	14,268	12,318	10,971	11,412	11,061	14,735	12,290	12,695	11,131	13,239	14,691	153,043
Total Requirements (Energy + Losses)	15,360	15,399	13,295	11,841	12,317	11,938	15,903	13,264	13,702	12,014	14,289	15,856	165,178
# of Large Comm & Ind Customers	103	103	102	105	105	105	105	105	106	106	106	107	105
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	25.6	24.1	26.2	20.2	16.0	23.8	28.8	26.1	20.8	19.3	27.2	29.2	29.2

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2017

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,071.8	997.1	883.5	740.2	723.8	729.6	974.8	842.4	763.2	712.5	879.7	1,063.9	10,380.3
# of Residential Customers	6,642	6,638	6,637	6,643	6,661	6,676	6,701	6,699	6,690	6,674	6,650	6,632	6,662
Total Residential Sales - MWh	7,119	6,619	5,864	4,917	4,821	4,871	6,532	5,643	5,106	4,755	5,850	7,056	69,153
Use per Small Comm & Ind Customer - kWh	2,006.6	1,995.0	1,705.9	1,535.1	1,541.9	1,538.6	2,052.9	1,747.2	1,742.9	1,543.2	1,830.0	2,009.3	21,236.6
# of Small Comm & Ind Customers	1,810	1,807	1,809	1,835	1,873	1,890	1,891	1,887	1,879	1,850	1,835	1,833	1,850
Total Small Comm & Ind Sales - MWh	3,632	3,605	3,086	2,817	2,888	2,908	3,882	3,297	3,275	2,855	3,358	3,683	39,286
Large Comm & Ind Sales	3,262	3,819	3,157	3,032	3,483	3,064	4,105	3,158	4,103	3,334	3,835	3,748	42,100
Total Sales (Residential, SC&I and LC&I)	14,013	14,043	12,107	10,766	11,192	10,843	14,519	12,098	12,484	10,944	13,043	14,487	150,539
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,334	14,391	12,425	11,083	11,536	11,184	14,903	12,420	12,847	11,252	13,371	14,815	154,561
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,393	14,439	12,463	11,105	11,556	11,195	14,916	12,435	12,860	11,271	13,403	14,864	154,900
Total Requirements (Energy + Losses)	15,534	15,584	13,451	11,986	12,472	12,083	16,099	13,421	13,880	12,165	14,466	16,043	167,184
# of Large Comm & Ind Customers	103	103	102	105	105	105	105	105	106	106	106	107	105
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	25.3	23.9	25.9	20.0	16.2	24.0	29.1	26.4	21.0	19.5	27.5	29.6	29.6

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2018

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,076.7	1,001.7	887.6	743.6	727.2	733.0	979.1	846.4	766.9	715.7	883.7	1,069.1	10,428.5
# of Residential Customers	6,648	6,644	6,643	6,649	6,667	6,682	6,708	6,705	6,696	6,680	6,656	6,638	6,668
Total Residential Sales - MWh	7,158	6,655	5,896	4,944	4,848	4,898	6,568	5,675	5,135	4,781	5,882	7,097	69,537
Use per Small Comm & Ind Customer - kWh	2,024.8	2,013.2	1,721.8	1,550.0	1,556.7	1,553.3	2,072.7	1,762.4	1,759.7	1,557.7	1,847.4	2,027.2	21,434.7
# of Small Comm & Ind Customers	1,816	1,813	1,815	1,840	1,879	1,896	1,897	1,894	1,885	1,856	1,841	1,839	1,856
Total Small Comm & Ind Sales - MWh	3,677	3,650	3,125	2,852	2,925	2,945	3,932	3,338	3,317	2,891	3,401	3,728	39,781
Large Comm & Ind Sales	3,342	3,912	3,234	3,106	3,568	3,139	4,206	3,235	4,203	3,416	3,929	3,840	43,130
Total Sales (Residential, SC&I and LC&I)	14,177	14,217	12,255	10,902	11,341	10,982	14,706	12,248	12,655	11,088	13,212	14,665	152,448
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,498	14,565	12,573	11,219	11,685	11,323	15,090	12,570	13,018	11,396	13,540	14,993	156,470
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,557	14,613	12,611	11,241	11,705	11,334	15,103	12,585	13,031	11,415	13,572	15,042	156,809
Total Requirements (Energy + Losses)	15,711	15,772	13,611	12,132	12,633	12,233	16,301	13,583	14,064	12,320	14,648	16,235	169,243
# of Large Comm & Ind Customers	103	103	102	105	105	105	105	105	106	106	106	107	105
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	25.7	24.2	26.3	20.3	16.3	24.3	29.4	26.6	21.2	19.7	27.8	29.9	29.9

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2019

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,082.4	1,006.8	892.1	747.4	730.8	736.7	984.1	850.7	770.8	719.4	888.2	1,054.0	10,461.1
# of Residential Customers	6,653	6,649	6,648	6,654	6,672	6,687	6,713	6,710	6,701	6,685	6,661	6,643	6,673
Total Residential Sales - MWh	7,201	6,694	5,931	4,973	4,876	4,926	6,606	5,708	5,165	4,809	5,916	7,002	69,807
Use per Small Comm & Ind Customer - kWh	2,045.6	2,034.1	1,739.3	1,565.9	1,572.8	1,569.2	2,093.7	1,780.7	1,777.5	1,574.0	1,866.1	2,048.9	21,655.6
# of Small Comm & Ind Customers	1,819	1,816	1,818	1,843	1,882	1,899	1,900	1,897	1,888	1,859	1,844	1,842	1,859
Total Small Comm & Ind Sales - MWh	3,721	3,694	3,162	2,886	2,960	2,980	3,978	3,378	3,356	2,926	3,441	3,774	40,256
Large Comm & Ind Sales	3,424	4,009	3,314	3,182	3,656	3,217	4,309	3,315	4,307	3,500	4,026	3,935	44,194
Total Sales (Residential, SC&I and LC&I)	14,346	14,397	12,407	11,041	11,492	11,123	14,893	12,401	12,828	11,235	13,383	14,711	154,257
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,667	14,745	12,725	11,358	11,836	11,464	15,277	12,723	13,191	11,543	13,711	15,039	158,279
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,726	14,793	12,763	11,380	11,856	11,475	15,290	12,738	13,204	11,562	13,743	15,088	158,618
Total Requirements (Energy + Losses)	15,894	15,966	13,775	12,282	12,796	12,385	16,502	13,748	14,251	12,479	14,833	16,284	171,195
# of Large Comm & Ind Customers	104	104	103	106	106	106	107	107	107	108	108	108	106
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	25.9	24.5	26.6	20.5	16.5	24.5	29.7	26.9	21.4	19.9	28.0	30.1	30.1

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2020

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,053.6	980.2	868.6	727.5	711.5	717.2	958.0	828.1	750.3	700.2	864.5	1,038.1	10,195.6
# of Residential Customers	6,656	6,652	6,650	6,657	6,675	6,690	6,716	6,713	6,704	6,688	6,664	6,646	6,676
Total Residential Sales - MWh	7,013	6,520	5,776	4,843	4,749	4,798	6,434	5,559	5,030	4,683	5,761	6,899	68,065
Use per Small Comm & Ind Customer - kWh	2,065.2	2,053.3	1,755.9	1,580.6	1,586.9	1,584.6	2,112.8	1,797.6	1,794.5	1,589.1	1,883.7	2,068.2	21,860.1
# of Small Comm & Ind Customers	1,824	1,821	1,823	1,848	1,888	1,904	1,906	1,902	1,893	1,864	1,849	1,847	1,864
Total Small Comm & Ind Sales - MWh	3,767	3,739	3,201	2,921	2,996	3,017	4,027	3,419	3,397	2,962	3,483	3,820	40,749
Large Comm & Ind Sales	3,509	4,108	3,396	3,261	3,747	3,296	4,416	3,398	4,414	3,586	4,125	4,032	45,288
Total Sales (Residential, SC&I and LC&I)	14,289	14,367	12,373	11,025	11,492	11,111	14,877	12,376	12,841	11,231	13,369	14,751	154,102
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,610	14,715	12,691	11,342	11,836	11,452	15,261	12,698	13,204	11,539	13,697	15,079	158,124
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,669	14,763	12,729	11,364	11,856	11,463	15,274	12,713	13,217	11,558	13,729	15,128	158,463
Total Requirements (Energy + Losses)	15,832	15,934	13,738	12,265	12,796	12,372	16,485	13,721	14,265	12,474	14,818	16,327	171,027
# of Large Comm & Ind Customers	104	104	103	106	106	106	107	107	107	108	108	108	106
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	26.1	24.6	26.7	20.6	16.5	24.4	29.6	26.8	21.3	19.8	28.0	30.1	30.1

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2021

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,046.3	973.2	862.4	722.5	706.5	712.0	951.2	822.2	745.0	695.4	858.5	1,038.7	10,131.8
# of Residential Customers	6,658	6,654	6,652	6,659	6,677	6,692	6,718	6,715	6,706	6,690	6,666	6,648	6,678
Total Residential Sales - MWh	6,966	6,476	5,737	4,811	4,717	4,765	6,390	5,521	4,996	4,652	5,723	6,905	67,659
Use per Small Comm & Ind Customer - kWh	2,085.9	2,074.0	1,773.4	1,596.7	1,603.1	1,600.6	2,134.0	1,815.8	1,812.9	1,604.9	1,902.9	2,089.1	22,080.9
# of Small Comm & Ind Customers	1,828	1,825	1,827	1,852	1,892	1,908	1,910	1,906	1,897	1,868	1,853	1,851	1,868
Total Small Comm & Ind Sales - MWh	3,813	3,785	3,240	2,957	3,033	3,054	4,076	3,461	3,439	2,998	3,526	3,867	41,249
Large Comm & Ind Sales	3,595	4,209	3,479	3,341	3,838	3,377	4,524	3,481	4,522	3,675	4,227	4,131	46,399
Total Sales (Residential, SC&I and LC&I)	14,374	14,470	12,456	11,109	11,588	11,196	14,990	12,463	12,957	11,325	13,476	14,903	155,307
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,695	14,818	12,774	11,426	11,932	11,537	15,374	12,785	13,320	11,633	13,804	15,231	159,329
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,754	14,866	12,812	11,448	11,952	11,548	15,387	12,800	13,333	11,652	13,836	15,280	159,668
Total Requirements (Energy + Losses)	15,924	16,045	13,828	12,356	12,900	12,464	16,607	13,815	14,390	12,576	14,933	16,492	172,330
# of Large Comm & Ind Customers	104	104	103	106	106	106	107	107	107	108	108	108	106
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	26.1	24.6	26.7	20.6	16.5	24.5	29.7	26.9	21.4	19.9	28.1	30.2	30.2

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**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

SOUTH DAKOTA YEAR 2022

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,052.1	978.7	867.3	726.5	710.4	716.2	956.5	826.9	749.3	699.3	863.4	1,044.4	10,188.7
# of Residential Customers	6,660	6,656	6,654	6,661	6,679	6,694	6,720	6,717	6,708	6,692	6,668	6,650	6,680
Total Residential Sales - MWh	7,007	6,514	5,771	4,839	4,745	4,794	6,428	5,554	5,026	4,680	5,757	6,945	68,060
Use per Small Comm & Ind Customer - kWh	2,107.0	2,094.0	1,790.9	1,612.3	1,618.3	1,615.8	2,155.1	1,833.6	1,829.2	1,620.4	1,921.4	2,108.8	22,294.3
# of Small Comm & Ind Customers	1,832	1,830	1,832	1,857	1,897	1,913	1,915	1,911	1,903	1,873	1,858	1,856	1,873
Total Small Comm & Ind Sales - MWh	3,860	3,832	3,281	2,994	3,070	3,091	4,127	3,504	3,481	3,035	3,570	3,914	41,759
Large Comm & Ind Sales	3,684	4,313	3,566	3,424	3,933	3,461	4,636	3,567	4,634	3,766	4,332	4,234	47,550
Total Sales (Residential, SC&I and LC&I)	14,551	14,659	12,618	11,257	11,748	11,346	15,191	12,625	13,141	11,481	13,659	15,093	157,369
Other Public Sales	93	136	95	96	122	128	167	101	148	80	106	114	1,386
Street & Highway Lighting Sales	227	211	222	220	222	213	217	221	215	227	221	213	2,629
Interdepartmental Sales	1	1	1	1	-	-	-	-	-	1	1	1	7
Total Billed Sales - MWh	14,872	15,007	12,936	11,574	12,092	11,687	15,575	12,947	13,504	11,789	13,987	15,421	161,391
Company Use	59	48	38	22	20	11	13	15	13	19	32	49	339
Total Energy	14,931	15,055	12,974	11,596	12,112	11,698	15,588	12,962	13,517	11,808	14,019	15,470	161,730
Total Requirements (Energy + Losses)	16,115	16,249	14,003	12,515	13,072	12,626	16,824	13,990	14,589	12,744	15,131	16,697	174,555
# of Large Comm & Ind Customers	104	104	103	106	106	106	107	107	107	108	108	108	106
# of Other Public Customers	50	50	50	52	56	57	57	56	55	52	50	50	53
# of Street & Highway Lighting Customers	40	40	40	40	40	41	40	40	40	40	40	40	40
Peak Demand Net of Energy Efficiency Progs	26.2	24.7	26.8	20.7	16.7	24.8	30.0	27.2	21.6	20.1	28.4	30.5	30.5

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APPENDIX G

Monthly Forecasts – Integrated System (2013-2022)

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2013

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,047.1	979.1	856.4	735.1	729.6	755.4	1,034.9	907.1	787.4	726.5	886.3	1,051.7	10,497.0
# of Residential Customers	95,578	95,604	95,611	95,565	95,667	95,786	95,899	95,994	96,036	96,111	96,171	96,189	95,851
Total Residential Sales - MWh	100,075	93,610	81,885	70,253	69,801	72,354	99,250	87,072	75,619	69,821	85,239	101,164	1,006,143
Use per Small Comm & Ind Customer - kWh	3,539.1	3,461.5	3,176.4	2,866.1	2,949.0	2,875.0	3,601.3	3,372.3	3,152.5	3,008.7	3,333.0	3,577.5	38,907.4
# of Small Comm & Ind Customers	18,379	18,369	18,382	18,530	18,730	18,838	18,863	18,905	18,880	18,738	18,672	18,670	18,663
Total Small Comm & Ind Sales - MWh	65,046	63,584	58,388	53,108	55,235	54,160	67,932	63,754	59,519	56,377	62,234	66,792	726,129
Large Comm & Ind Sales	97,772	96,244	93,880	94,025	95,177	92,423	103,624	97,911	100,676	98,365	98,243	107,597	1,175,937
Total Sales (Residential, SC&I and LC&I)	262,893	253,438	234,153	217,386	220,213	218,937	270,806	248,737	235,814	224,563	245,716	275,553	2,908,209
Other Public Sales	3,561	3,589	3,454	3,325	3,815	4,101	4,925	4,516	3,959	3,406	3,372	3,572	45,595
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	269,185	259,559	240,157	223,164	226,479	225,306	278,119	255,682	242,225	230,584	251,770	281,788	2,984,018
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	269,927	260,220	240,821	223,805	227,138	225,962	278,844	256,414	242,862	231,230	252,422	282,478	2,992,123
Total Requirements (Energy + Losses)	291,329	280,854	259,916	241,550	245,148	243,879	300,953	276,745	262,119	249,564	272,436	304,876	3,229,369
# of Large Comm & Ind Customers	1,001	1,003	1,002	1,011	1,015	1,017	1,018	1,010	1,010	1,008	1,006	1,005	1,009
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	509.7	490.3	452.9	399.2	401.2	521.7	582.3	547.4	466.1	386.3	509.2	582.0	582.3

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2014

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,051.7	983.5	860.2	738.4	732.9	758.8	1,039.7	911.2	791.0	729.7	890.3	1,054.1	10,541.7
# of Residential Customers	97,188	97,213	97,221	97,173	97,277	97,398	97,512	97,609	97,652	97,728	97,789	97,809	97,464
Total Residential Sales - MWh	102,212	95,610	83,631	71,754	71,295	73,902	101,380	88,939	77,239	71,312	87,060	103,103	1,027,437
Use per Small Comm & Ind Customer - kWh	3,588.6	3,509.7	3,221.1	2,906.6	2,990.9	2,915.9	3,651.5	3,420.2	3,196.8	3,051.8	3,380.1	3,618.9	39,447.2
# of Small Comm & Ind Customers	18,986	18,975	18,989	19,141	19,346	19,457	19,483	19,528	19,502	19,355	19,288	19,287	19,278
Total Small Comm & Ind Sales - MWh	68,134	66,597	61,166	55,636	57,861	56,735	71,143	66,789	62,344	59,068	65,196	69,798	760,467
Large Comm & Ind Sales	106,243	104,406	102,076	102,086	103,461	100,608	117,670	111,589	114,027	111,673	111,276	119,300	1,304,415
Total Sales (Residential, SC&I and LC&I)	276,589	266,613	246,873	229,476	232,617	231,245	290,193	267,317	253,610	242,053	263,532	292,201	3,092,319
Other Public Sales	3,582	3,609	3,474	3,345	3,837	4,124	4,952	4,542	3,980	3,426	3,391	3,592	45,854
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	282,902	272,754	252,897	235,274	238,905	237,637	297,533	274,288	260,042	248,094	269,605	298,456	3,168,387
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	283,644	273,415	253,561	235,915	239,564	238,293	298,258	275,020	260,679	248,740	270,257	299,146	3,176,492
Total Requirements (Energy + Losses)	306,134	295,093	273,665	254,621	258,559	257,187	321,907	296,827	281,348	268,463	291,686	322,865	3,428,355
# of Large Comm & Ind Customers	1,038	1,040	1,039	1,048	1,053	1,054	1,055	1,047	1,047	1,045	1,043	1,042	1,046
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	548.4	527.5	486.9	429.6	418.2	544.0	606.9	570.7	486.1	403.0	535.7	612.6	612.6

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2015

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,055.5	987.1	863.3	741.1	735.6	761.6	1,043.6	914.7	793.9	732.4	893.6	1,056.2	10,578.8
# of Residential Customers	98,544	98,569	98,578	98,529	98,634	98,756	98,872	98,970	99,014	99,091	99,154	99,173	98,824
Total Residential Sales - MWh	104,010	97,293	85,102	73,020	72,556	75,213	103,185	90,523	78,608	72,573	88,600	104,750	1,045,433
Use per Small Comm & Ind Customer - kWh	3,639.7	3,559.4	3,267.3	2,948.2	3,033.7	2,957.5	3,703.0	3,469.4	3,242.4	3,095.7	3,428.4	3,665.9	40,005.6
# of Small Comm & Ind Customers	19,522	19,511	19,525	19,682	19,891	20,007	20,033	20,078	20,051	19,903	19,834	19,832	19,822
Total Small Comm & Ind Sales - MWh	71,055	69,448	63,795	58,027	60,343	59,170	74,182	69,658	65,014	61,613	67,999	72,703	793,007
Large Comm & Ind Sales	113,783	111,418	109,531	109,357	110,953	107,911	123,458	117,231	119,577	117,235	116,723	124,703	1,381,880
Total Sales (Residential, SC&I and LC&I)	288,848	278,159	258,428	240,404	243,852	242,294	300,825	277,412	263,199	251,421	273,322	302,156	3,220,320
Other Public Sales	3,602	3,630	3,496	3,364	3,859	4,148	4,979	4,567	4,002	3,446	3,410	3,613	46,116
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	295,181	284,321	264,474	246,221	250,162	248,710	308,192	284,408	269,653	257,482	279,414	308,432	3,296,650
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	295,923	284,982	265,138	246,862	250,821	249,366	308,917	285,140	270,290	258,128	280,066	309,122	3,304,755
Total Requirements (Energy + Losses)	319,387	307,578	286,161	266,436	270,709	269,138	333,411	307,749	291,722	278,595	302,273	333,632	3,566,791
# of Large Comm & Ind Customers	1,071	1,074	1,073	1,082	1,087	1,088	1,090	1,081	1,081	1,079	1,076	1,076	1,080
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	577.2	555.3	512.4	452.1	430.6	560.5	625.1	587.9	500.9	415.5	554.2	633.9	633.9

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2016

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,057.5	989.0	864.9	742.6	737.2	763.3	1,046.0	916.8	795.7	733.9	895.4	1,059.8	10,602.5
# of Residential Customers	99,800	99,826	99,835	99,785	99,891	100,015	100,132	100,232	100,276	100,355	100,419	100,438	100,084
Total Residential Sales - MWh	105,543	98,731	86,352	74,100	73,635	76,338	104,742	91,892	79,787	73,655	89,920	106,443	1,061,138
Use per Small Comm & Ind Customer - kWh	3,703.7	3,622.1	3,325.2	3,000.3	3,087.4	3,009.9	3,767.9	3,530.7	3,299.3	3,150.9	3,489.3	3,728.8	40,710.4
# of Small Comm & Ind Customers	19,962	19,949	19,964	20,125	20,338	20,456	20,483	20,530	20,503	20,350	20,279	20,278	20,268
Total Small Comm & Ind Sales - MWh	73,934	72,258	66,384	60,382	62,791	61,571	77,177	72,486	67,646	64,120	70,760	75,612	825,121
Large Comm & Ind Sales	118,493	115,830	114,183	113,905	115,631	112,475	125,362	119,022	121,400	118,991	118,472	125,196	1,418,960
Total Sales (Residential, SC&I and LC&I)	297,970	286,819	266,919	248,387	252,057	250,384	307,281	283,400	268,833	256,766	279,152	307,251	3,305,219
Other Public Sales	3,623	3,651	3,515	3,383	3,881	4,172	5,007	4,593	4,024	3,466	3,430	3,633	46,378
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	304,324	293,002	272,984	254,223	258,389	256,824	314,676	290,422	275,309	262,847	285,264	313,547	3,381,811
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	305,066	293,663	273,648	254,864	259,048	257,480	315,401	291,154	275,946	263,493	285,916	314,237	3,389,916
Total Requirements (Energy + Losses)	329,254	316,947	295,346	275,072	279,588	277,895	340,408	314,239	297,826	284,386	308,587	339,153	3,658,701
# of Large Comm & Ind Customers	1,098	1,100	1,101	1,109	1,114	1,115	1,117	1,108	1,108	1,106	1,103	1,103	1,107
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	597.3	574.5	530.1	467.7	439.4	571.9	637.7	599.8	511.2	424.0	566.3	647.9	647.9

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**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2017

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,062.7	993.9	869.2	746.3	740.8	767.1	1,051.3	921.4	799.6	737.6	899.9	1,064.3	10,654.4
# of Residential Customers	101,005	101,031	101,040	100,990	101,096	101,221	101,339	101,439	101,485	101,565	101,631	101,650	101,291
Total Residential Sales - MWh	107,341	100,415	87,824	75,364	74,893	77,643	106,539	93,466	81,151	74,914	91,455	108,189	1,079,194
Use per Small Comm & Ind Customer - kWh	3,768.8	3,685.3	3,383.9	3,053.3	3,141.7	3,063.0	3,833.6	3,593.1	3,357.3	3,206.6	3,551.0	3,789.7	41,422.0
# of Small Comm & Ind Customers	20,394	20,382	20,396	20,560	20,778	20,898	20,925	20,974	20,946	20,791	20,718	20,718	20,707
Total Small Comm & Ind Sales - MWh	76,860	75,113	69,018	62,776	65,278	64,011	80,218	75,361	70,322	66,669	73,570	78,515	857,711
Large Comm & Ind Sales	117,535	114,943	113,448	113,311	115,211	112,216	125,183	118,808	121,090	118,510	117,788	125,524	1,413,567
Total Sales (Residential, SC&I and LC&I)	301,736	290,471	270,290	251,451	255,382	253,870	311,940	287,635	272,563	260,093	282,813	312,228	3,350,472
Other Public Sales	3,644	3,671	3,536	3,402	3,902	4,195	5,034	4,618	4,046	3,485	3,449	3,654	46,636
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	308,111	296,674	276,376	257,306	261,735	260,333	319,362	294,682	279,061	266,193	288,944	318,545	3,427,322
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	308,853	297,335	277,040	257,947	262,394	260,989	320,087	295,414	279,698	266,839	289,596	319,235	3,435,427
Total Requirements (Energy + Losses)	333,341	320,911	299,007	278,400	283,199	281,684	345,467	318,838	301,875	287,997	312,559	344,548	3,707,826
# of Large Comm & Ind Customers	1,125	1,127	1,128	1,136	1,141	1,143	1,144	1,135	1,134	1,133	1,130	1,130	1,134
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	610.5	587.3	541.6	478.0	444.9	579.1	645.7	607.4	517.7	429.3	573.0	655.6	655.6

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2018

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,067.9	998.8	873.5	749.9	744.5	770.9	1,056.6	926.0	803.6	741.2	904.3	1,069.2	10,706.8
# of Residential Customers	102,108	102,134	102,143	102,092	102,200	102,326	102,446	102,547	102,593	102,674	102,740	102,761	102,397
Total Residential Sales - MWh	109,045	102,011	89,217	76,561	76,087	78,881	108,242	94,960	82,446	76,106	92,910	109,877	1,096,343
Use per Small Comm & Ind Customer - kWh	3,830.6	3,745.5	3,439.8	3,103.9	3,193.4	3,113.5	3,896.1	3,652.2	3,412.5	3,259.8	3,609.6	3,850.0	42,101.5
# of Small Comm & Ind Customers	20,814	20,802	20,816	20,982	21,206	21,328	21,356	21,406	21,377	21,219	21,145	21,145	21,133
Total Small Comm & Ind Sales - MWh	79,730	77,914	71,602	65,125	67,719	66,405	83,205	78,180	72,948	69,170	76,324	81,409	889,731
Large Comm & Ind Sales	118,876	116,278	114,752	114,610	116,535	113,521	126,645	120,180	122,506	119,880	119,155	126,971	1,429,909
Total Sales (Residential, SC&I and LC&I)	307,651	296,203	275,571	256,296	260,341	258,807	318,092	293,320	277,900	265,156	288,389	318,257	3,415,983
Other Public Sales	3,666	3,691	3,556	3,421	3,924	4,219	5,061	4,644	4,067	3,505	3,468	3,675	46,897
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	314,048	302,426	281,677	262,170	266,716	265,294	325,541	300,393	284,419	271,276	294,539	324,595	3,493,094
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	314,790	303,087	282,341	262,811	267,375	265,950	326,266	301,125	285,056	271,922	295,191	325,285	3,501,199
Total Requirements (Energy + Losses)	339,749	327,119	304,728	283,649	288,575	287,037	352,136	325,002	307,658	293,482	318,597	351,077	3,778,809
# of Large Comm & Ind Customers	1,150	1,152	1,153	1,161	1,166	1,168	1,170	1,161	1,159	1,158	1,155	1,155	1,159
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	617.8	594.3	548.2	483.7	452.1	588.4	656.1	617.1	526.0	436.2	582.4	666.4	666.4

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2019

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,073.3	1,003.8	877.8	753.7	748.3	774.8	1,062.0	930.7	807.7	745.0	908.9	1,072.6	10,758.9
# of Residential Customers	103,159	103,187	103,196	103,144	103,252	103,380	103,501	103,603	103,650	103,732	103,800	103,820	103,452
Total Residential Sales - MWh	110,724	103,582	90,590	77,741	77,260	80,096	109,914	96,427	83,718	77,279	94,341	111,362	1,113,034
Use per Small Comm & Ind Customer - kWh	3,893.7	3,807.0	3,496.6	3,155.1	3,246.3	3,165.1	3,959.9	3,712.9	3,468.6	3,314.2	3,669.4	3,909.1	42,792.6
# of Small Comm & Ind Customers	21,223	21,211	21,225	21,395	21,621	21,746	21,774	21,826	21,797	21,636	21,561	21,561	21,548
Total Small Comm & Ind Sales - MWh	82,637	80,751	74,216	67,503	70,189	68,829	86,223	81,037	75,604	71,705	79,117	84,285	922,096
Large Comm & Ind Sales	120,233	117,629	116,069	115,925	117,876	114,840	128,121	121,564	123,936	121,265	120,537	128,435	1,446,430
Total Sales (Residential, SC&I and LC&I)	313,594	301,962	280,875	261,169	265,325	263,765	324,258	299,028	283,258	270,249	293,995	324,082	3,481,560
Other Public Sales	3,687	3,712	3,577	3,440	3,945	4,242	5,088	4,670	4,090	3,524	3,487	3,695	47,157
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	320,012	308,206	287,002	267,062	271,721	270,275	331,734	306,127	289,800	276,388	300,164	330,440	3,558,931
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	320,754	308,867	287,666	267,703	272,380	270,931	332,459	306,859	290,437	277,034	300,816	331,130	3,567,036
Total Requirements (Energy + Losses)	346,187	333,358	310,475	288,929	293,977	292,413	358,820	331,190	313,466	299,000	324,668	357,385	3,849,868
# of Large Comm & Ind Customers	1,176	1,178	1,179	1,187	1,192	1,194	1,197	1,187	1,185	1,185	1,182	1,181	1,185
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	628.0	604.2	557.3	491.7	459.4	597.8	666.6	627.0	534.3	443.1	591.9	677.2	677.2

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2020

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,076.5	1,006.8	880.4	755.9	750.5	777.2	1,065.3	933.7	810.2	747.2	911.6	1,076.3	10,792.0
# of Residential Customers	104,111	104,138	104,145	104,095	104,204	104,332	104,454	104,557	104,605	104,688	104,755	104,777	104,405
Total Residential Sales - MWh	112,071	104,845	91,689	78,690	78,207	81,084	111,278	97,625	84,751	78,227	95,498	112,771	1,126,736
Use per Small Comm & Ind Customer - kWh	3,953.1	3,865.0	3,550.0	3,203.3	3,295.7	3,213.7	4,019.7	3,769.7	3,521.5	3,365.3	3,725.7	3,967.1	43,444.3
# of Small Comm & Ind Customers	21,621	21,608	21,624	21,796	22,027	22,153	22,183	22,235	22,205	22,041	21,965	21,965	21,952
Total Small Comm & Ind Sales - MWh	85,471	83,515	76,765	69,820	72,595	71,192	89,168	83,819	78,194	74,174	81,835	87,138	953,686
Large Comm & Ind Sales	121,607	118,995	117,403	117,255	119,232	116,172	129,616	122,968	125,385	122,664	121,936	129,917	1,463,150
Total Sales (Residential, SC&I and LC&I)	319,149	307,355	285,857	265,765	270,034	268,448	330,062	304,412	288,330	275,065	299,269	329,826	3,543,572
Other Public Sales	3,707	3,731	3,596	3,459	3,968	4,265	5,115	4,696	4,112	3,544	3,506	3,715	47,414
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	325,587	313,618	292,003	271,677	276,453	274,981	337,565	311,537	294,894	281,224	305,457	336,204	3,621,200
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	326,329	314,279	292,667	272,318	277,112	275,637	338,290	312,269	295,531	281,870	306,109	336,894	3,629,305
Total Requirements (Energy + Losses)	352,204	339,198	315,872	293,910	299,085	297,492	365,113	337,029	318,964	304,219	330,381	363,606	3,917,073
# of Large Comm & Ind Customers	1,200	1,202	1,203	1,212	1,217	1,218	1,221	1,211	1,209	1,209	1,206	1,204	1,209
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	638.2	614.0	566.2	499.7	466.5	606.7	676.6	636.3	542.3	449.6	601.2	687.8	687.8

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2021

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,081.0	1,011.1	884.1	759.2	753.8	780.5	1,070.0	937.8	813.7	750.5	915.6	1,080.8	10,838.3
# of Residential Customers	105,010	105,038	105,045	104,993	105,103	105,234	105,356	105,460	105,508	105,592	105,661	105,682	105,307
Total Residential Sales - MWh	113,521	106,203	92,875	79,710	79,223	82,138	112,728	98,899	85,852	79,244	96,739	114,219	1,141,351
Use per Small Comm & Ind Customer - kWh	4,013.7	3,923.8	3,604.7	3,252.7	3,346.3	3,263.1	4,080.6	3,827.8	3,575.2	3,417.3	3,783.1	4,023.4	44,106.2
# of Small Comm & Ind Customers	22,008	21,996	22,011	22,186	22,421	22,549	22,580	22,632	22,603	22,436	22,359	22,359	22,345
Total Small Comm & Ind Sales - MWh	88,334	86,309	79,343	72,164	75,028	73,580	92,139	86,631	80,810	76,671	84,586	89,959	985,554
Large Comm & Ind Sales	122,996	120,380	118,752	118,603	120,602	117,521	131,132	124,387	126,850	124,082	123,352	131,350	1,480,007
Total Sales (Residential, SC&I and LC&I)	324,851	312,892	290,970	270,477	274,853	273,239	335,999	309,917	293,512	279,997	304,677	335,528	3,606,912
Other Public Sales	3,728	3,752	3,617	3,478	3,990	4,289	5,142	4,721	4,133	3,564	3,526	3,736	47,676
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	331,310	319,176	297,137	276,408	281,294	279,796	343,529	317,067	300,097	286,176	310,885	341,927	3,684,802
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	332,052	319,837	297,801	277,049	281,953	280,452	344,254	317,799	300,734	286,822	311,537	342,617	3,692,907
Total Requirements (Energy + Losses)	358,381	345,197	321,414	299,016	304,309	302,689	371,550	342,997	324,579	309,564	336,239	369,784	3,985,719
# of Large Comm & Ind Customers	1,225	1,227	1,228	1,237	1,242	1,243	1,246	1,236	1,234	1,233	1,231	1,229	1,234
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	648.3	623.6	575.0	507.5	473.5	615.9	686.7	645.8	550.4	456.2	610.2	698.2	698.2

**MONTHLY FORECASTS
SALES AND ENERGY (MWH)
PEAK DEMAND (MW)**

INTEGRATED SYSTEM YEAR 2022

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Use per Residential Customer - kWh	1,086.5	1,016.2	888.6	763.0	757.5	784.5	1,075.4	942.5	817.8	754.2	920.2	1,085.6	10,892.3
# of Residential Customers	105,810	105,838	105,845	105,793	105,904	106,035	106,159	106,263	106,311	106,396	106,466	106,488	106,109
Total Residential Sales - MWh	114,960	107,548	94,051	80,719	80,227	83,181	114,162	100,156	86,943	80,249	97,967	115,604	1,155,767
Use per Small Comm & Ind Customer - kWh	4,070.7	3,979.5	3,656.1	3,299.0	3,393.9	3,309.7	4,138.3	3,882.4	3,625.9	3,466.3	3,837.1	4,077.7	44,731.2
# of Small Comm & Ind Customers	22,381	22,368	22,384	22,562	22,800	22,930	22,961	23,015	22,986	22,816	22,738	22,739	22,723
Total Small Comm & Ind Sales - MWh	91,107	89,014	81,839	74,433	77,382	75,891	95,020	89,354	83,344	79,087	87,249	92,722	1,016,442
Large Comm & Ind Sales	124,280	121,653	119,979	119,828	121,851	118,745	132,507	125,671	128,182	125,373	124,650	132,733	1,495,452
Total Sales (Residential, SC&I and LC&I)	330,347	318,215	295,869	274,980	279,460	277,817	341,689	315,181	298,469	284,709	309,866	341,059	3,667,661
Other Public Sales	3,748	3,772	3,637	3,497	4,011	4,312	5,169	4,747	4,155	3,583	3,545	3,756	47,932
Street & Highway Lighting Sales	2,689	2,489	2,513	2,418	2,417	2,239	2,354	2,400	2,419	2,583	2,643	2,619	29,783
Interdepartmental Sales	42	43	37	35	34	29	34	29	33	32	39	44	431
Total Billed Sales - MWh	336,826	324,519	302,056	280,930	285,922	284,397	349,246	322,357	305,076	290,907	316,093	347,478	3,745,807
Company Use	742	661	664	641	659	656	725	732	637	646	652	690	8,105
Total Energy	337,568	325,180	302,720	281,571	286,581	285,053	349,971	323,089	305,713	291,553	316,745	348,168	3,753,912
Total Requirements (Energy + Losses)	364,334	350,964	326,723	303,897	309,304	307,655	377,720	348,707	329,954	314,670	341,860	375,774	4,051,562
# of Large Comm & Ind Customers	1,247	1,249	1,249	1,259	1,264	1,265	1,268	1,258	1,256	1,255	1,253	1,251	1,256
# of Other Public Customers	847	847	848	857	869	870	870	868	863	855	846	843	857
# of Street & Highway Lighting Customers	664	660	658	659	659	661	643	646	647	649	650	653	654
Peak Demand Net of Energy Efficiency Progs	658.1	633.2	583.7	515.3	480.2	624.6	696.4	655.0	558.2	462.7	619.1	708.3	708.3

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