

Direct Testimony and Schedules
Jannell Marks

Before the North Dakota Public Service Commission
State of North Dakota

In the Matter of the Application of Northern States Power Company
a Minnesota corporation and Wholly Owned Subsidiary of Xcel Energy Inc.
For Authority to Increase Rates for
Natural Gas Service in North Dakota

Case No. PU-06-_____
Exhibit____

Sales Forecast

December 15, 2006

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1 **I. INTRODUCTION AND QUALIFICATIONS**

2
3 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

4 A. My name is Jannell Marks. My business address is 1225 17th Street, Denver,
5 Colorado 80202.

6
7 Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?

8 A. I am the Manager of the Energy Forecasting Department for Xcel Energy
9 Services Inc.

10
11 Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS AND EXPERIENCE.

12 A. I graduated from Colorado State University with a Bachelor of Science degree
13 in statistics. I began my employment with Public Service Company of
14 Colorado (“PSCo”) in 1982 in the Economics and Forecasting Department,
15 and in August 2000, following the merger of New Centuries Energy Inc.
16 (“NCE”) and Northern States Power Company, I assumed my current
17 position with Xcel Energy Services Inc. My resume is included as
18 Exhibit____(JM-1), Schedule 1, and the present organization chart for my
19 areas of responsibility as Exhibit____(JM-1), Schedule 2.

20
21 Q. FOR WHOM ARE YOU TESTIFYING?

22 A. I am providing testimony on behalf of Northern States Power Company, a
23 Minnesota corporation and wholly owned subsidiary of Xcel Energy Inc.
24 (“Xcel Energy” or the “Company”).

25
26 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

1 A. I will describe the historical customer and dekatherm (“Dkt”) sales trends for
2 Xcel Energy’s North Dakota service territory. In addition, I will present and
3 support Xcel Energy’s test year natural gas Dkt sales and customer forecast.
4

5 Q. ARE THERE INDUSTRY TERMS YOU PLAN TO USE IN YOUR TESTIMONY?

6 A. Yes. The definitions of terms that are included in my testimony are provided
7 in Exhibit____(JM-1), Schedule 3.
8

9 **II. HISTORICAL CUSTOMER AND DKT SALES TRENDS**

10

11 Q. PLEASE DISCUSS THE RECENT TRENDS IN CUSTOMER GROWTH, SALES
12 GROWTH, AND USE PER CUSTOMER.

13 A. The total number of North Dakota natural gas customers in Xcel Energy’s
14 service territory increased at an average annual rate of 2.6 percent from 2000
15 through 2005. The largest class of customers is the Residential class, which
16 represents 85 percent of total customers and has averaged a growth rate of 2.7
17 percent over this period.

18

19 Xcel Energy’s natural gas retail and transportation sales have increased very
20 slightly over the 2000 to 2005 time period, gaining an average 0.2 percent per
21 year after normalizing for weather. Firm sales have decreased 0.7 percent per
22 year on average over the past five years; residential sales have averaged
23 growth of 0.9 percent and total commercial and industrial firm sales have
24 decreased at an average annual rate of 2.1 percent from 2000 to 2005. The
25 average annual percent change in customers and sales by customer class over
26 the 2000 to 2005 time period is provided in Table JM-1.
27

1 Significantly, residential consumption from 2005 to the projected 2007 test
 2 year increased by 0.5 percent, reflecting a decline in use per customer of 3.0
 3 percent after accounting for customer growth. This indicates a continuation
 4 of the declining trend seen over the past five years.

6 **Table JM-1**

	2000-2005 Average Percent Change		
Customer Class	Number of Customers	Weather Normalized Sales	2005 % of Total Sales
Residential	2.7%	0.9%	30.7%
Total C&I	2.1%	-2.1%	35.5%
Total Firm	2.6%	-0.7%	66.2%
Total Interruptible	1.6%	-0.8%	18.6%
Interdepartmental		6.7%	0.0%
Total Retail	2.6%	-0.8%	84.8%
Total Transportation	0.0%	7.0%	15.2%
Total	2.6%	0.2%	100.0%

7
 8 **III. CUSTOMER AND SALES FORECAST**
 9

10 Q. WHAT GEOGRAPHICAL AREA DO THE TEST YEAR SALES REFLECT?

11 A. This part of my testimony and the subsequent exhibits reflect natural gas
 12 usage and customers in the Company's North Dakota jurisdiction.

13
 14 Q. PLEASE DESCRIBE THE CUSTOMER CATEGORIES INCLUDED IN XCEL ENERGY'S
 15 SALES FORECAST.

16 A. The following customer classes comprise Xcel Energy's sales forecast:

17 *Residential* – residential firm service.

18 *Commercial and Industrial* – commercial and industrial firm service.

1 *Small Volume Interruptible* – interruptible service to commercial and industrial
2 customers having maximum hourly requirements greater than 1 Dkt and
3 maximum daily requirements less than 200 Dkt.

4 *Large Volume Interruptible* – interruptible service to commercial and industrial
5 customers having maximum hourly requirements greater than 1 Dkt and
6 maximum daily requirements greater than 200 Dkt.

7 *Interruptible Transportation* – interruptible transportation service to customers
8 with maximum daily requirements greater than 200 Dkt.

9 *Interdepartmental Sales* – natural gas sales made internally to Xcel Energy
10 facilities for purposes other than the generation of electricity, such as heating
11 Service Centers.

12
13 Q. HOW IS THE SALES FORECAST USED IN THIS PROCEEDING?

14 A. The sales forecast is used to calculate the following:

- 15 a) The monthly and annual natural gas supply requirements;
16 b) Test year revenue under present rates; and
17 c) Test year revenue under proposed rates.

18
19 **IV. RESULTS**

20
21 Q. WHAT IS XCEL ENERGY'S FORECAST OF NATURAL GAS SALES AND CUSTOMERS
22 FOR THE TEST YEAR ENDING DECEMBER 31, 2007?

23 A. Exhibit____(JM-1), Schedule 4 summarizes monthly historical and test year
24 dekatherm (“Dkt”) sales, number of customers, and Dkt use per customer for
25 each customer class. The forecast for the Transportation class summarizes
26 monthly and test year deliveries. All forecasting is done in dekatherms, as

1 Xcel Energy bills customers in therms. Ten (10) therms equal one (1)
2 dekatherm, which also equals 1,000 cubic feet (one (1) Mcf).

3
4 Q. HOW DOES THE TEST YEAR NATURAL GAS CUSTOMER GROWTH COMPARE WITH
5 HISTORICAL CUSTOMER GROWTH?

6 A. As I stated earlier, the total number of natural gas customers in the Xcel
7 Energy North Dakota service territory increased at an average annual rate of
8 2.6 percent from 2000 through 2005. During the test year, the total number
9 of natural gas customers is expected to increase by 1,567 customers, or 3.7
10 percent, compared to 2005 or 1.8 percent per year.

11
12 Q. HOW DO THE TEST YEAR NATURAL GAS SALES COMPARE WITH 2005 WEATHER
13 NORMALIZED GAS SALES?

14 A. Total natural gas retail and transportation sales are expected to decline 1.0
15 percent during the 2007 test year compared to 2005. Total test year firm sales
16 are predicted to be 2.4 percent higher than 2005, reflecting an annual growth
17 of 1.2 percent. Within firm sales, test year Residential sales are expected to be
18 0.5 percent higher than 2005, reflecting annual sales growth of 0.3 percent.
19 Commercial and Industrial firm sales are expected to be 4.0 percent higher in
20 the test year than in 2005, which equates to an annual growth rate of 2.0
21 percent. Table JM-2 provides Xcel Energy's weather normalized retail and
22 transportation sales by customer class for 2005 and the test year 2007, and the
23 2007 growth rate compared to 2005.

1 **Table JM-2**

2 **Weather Normalized Sales by Class (Dkt)**

Customer Class	2005 Sales	2007 Sales	2007 % Change	Average Annual % Change
Residential	3,050,099	3,065,892	0.5%	0.3%
Total C&I	3,534,475	3,674,787	4.0%	2.0%
Total Firm	6,587,574	6,740,679	2.4%	1.2%
Total Interruptible	1,854,410	1,805,415	-2.6%	-1.3%
Interdepartmental	2,225	1,703	-23.4%	-12.5%
Total Retail	8,441,209	8,547,797	1.3%	0.6%
Total Transportation	1,507,729	1,306,504	-13.3%	-6.9%
Total	9,948,938	9,854,302	-1.0%	-0.5%

3

4 **V. OVERVIEW OF SALES FORECASTING METHODOLOGY**

5

6 Q. IS THE TEST YEAR FORECAST THE SAME FORECAST CURRENTLY BEING USED BY
 7 XCEL ENERGY FOR ITS 2007 FINANCIAL BUDGET?

8 A. Yes, it is, with the exception of the Commercial and Industrial firm sales
 9 forecast. The 2007 financial budget sales forecast was developed in March
 10 2006 and was based on actual customers and sales through December 2005.
 11 The Commercial and Industrial firm sales forecast was updated in November
 12 2006 to incorporate the latest available actual sales through October 2006.
 13 The Commercial and Industrial firm sales forecast was updated because 2006
 14 actual sales in this class have been weaker than expected, resulting in the
 15 original budget forecast growth for 2007 being too strong relative to 2006.
 16 The November revision resulted in a lower test year forecast, with more
 17 reasonable growth when compared to 2006 sales.

18

1 Q. PLEASE DESCRIBE IN GENERAL TERMS THE METHODS USED TO FORECAST
2 SALES AND CUSTOMERS.

3 A. The preparation of the natural gas sales and customer forecasts were
4 coordinated by the Energy Forecasting Department, with input from Xcel
5 Energy Key Account Managers and other Corporate support areas. The
6 Company used a combination of statistical forecasting techniques and
7 analyses to develop the sales and customer forecasts.

8

9 Q. HOW WERE THE SALES FORECASTS DEVELOPED FOR THE RESIDENTIAL,
10 COMMERCIAL AND INDUSTRIAL, SMALL VOLUME INTERRUPTIBLE, AND
11 LARGE VOLUME INTERRUPTIBLE CUSTOMER CLASSES?

12 A. Ordinary Least Squares (“OLS”) multiple regression models provided the
13 foundation for the sales forecasts of the Residential, Commercial and
14 Industrial, Small Volume Interruptible, and Large Volume Interruptible
15 customer classes. OLS multiple regression techniques are very well known
16 and proven methods, commonly accepted by forecasters throughout the
17 utility industry. This method provides reliable, accurate projections,
18 accommodates the use of predictor variables, such as weather, and allows
19 clear interpretation of the model. Xcel Energy has been using these types of
20 OLS regression models since 1991.

21

22 The Residential and Commercial and Industrial sales forecasts are developed
23 using a Statistically Adjusted End-Use (“SAE”) modeling approach. The SAE
24 method entails specifying energy usage as a function of the primary end-use
25 variables (heating and base use), and the factors that affect these end-use
26 energy requirements. The SAE Residential and Commercial and Industrial
27 sales models consist of equations for average use per customer and number of

1 customers. Regression models are estimated using monthly historical
2 customers, sales, weather, economics, price, and appliance saturation and
3 efficiency trend data. The Residential and Commercial and Industrial sales
4 forecasts are then calculated as the product of the average use and customer
5 forecasts.

6
7 Monthly sales forecasts for the Small Volume Interruptible and Large Volume
8 Interruptible customer classes were developed based on OLS regression
9 models designed to define a statistical relationship between the historical sales
10 and the independent predictor variables, such as historical weather (expressed
11 in heating degree days) and/or historical number of customers. The modeled
12 relationships were then simulated over the forecast period by assuming
13 normal weather (expressed in terms of twenty-year averaged heating degree
14 days) and the projected levels of the independent predictor variables.

15
16 Q. PLEASE FURTHER DESCRIBE THE SAE MODELING APPROACH.

17 A. The end-use variables incorporated into the average use per customer
18 regression models are defined in terms of both an appliance index variable,
19 which indicates relative saturation and efficiency of the stock of appliances,
20 and a utilization variable, which reflects how the stock is utilized. The end-
21 use variables are defined as:

$$22 \quad \textit{Heating} = \textit{Heat Index} * \textit{Heat Use}$$

$$23 \quad \textit{Base} = \textit{Base Index} * \textit{Base Use}$$

24
25
26 The indexes are calculated as the ratio of the appliance saturation and average
27 efficiency of the existing stock. The indexes reflect both changes in

1 saturation resulting from end-use competition and improvements in appliance
2 efficiency standards. The utilization variables (Heat Use and Base Use) are
3 designed to capture energy demand driven by the use of the appliance stock.
4 The primary factors that impact appliance use are weather conditions (as
5 measured by heating degree days), natural gas prices, household income, and
6 household size. The regression models effectively calibrate the end-use
7 concepts to actual average use. Monthly binary variables are included to
8 account for non-weather-related seasonal factors.

9
10 Q. WHAT PROCESS WAS USED TO FORECAST SALES IN THE REMAINING CUSTOMER
11 CLASSES?

12 A. The Interdepartmental and Transportation sales forecasts were developing by
13 calculating the two-year average of historical sales by month.

14
15 **VI. OVERVIEW OF CUSTOMER FORECASTING METHODOLOGY**

16
17 Q. WHAT PROCESS WAS USED FOR FORECASTING NUMBER OF CUSTOMERS?

18 A. The number of customers by customer class for the Residential and Small and
19 Large Commercial customer classes is forecasted using demographic or
20 economic data in OLS regression models. The number of customers for the
21 remaining customer classes is forecasted based on analysis of historical trends.
22 The historical number of customers by class is derived from the billing
23 system.

24
25 The regression models and associated analysis used in Xcel Energy's statistical
26 projections of customers is provided in Exhibit____(JM-1), Schedule 5. These

1 exhibits include, for each customer class, the models with their summary
2 statistics and output, and descriptions for each variable included in the model.

3
4 Q. HOW ACCURATE HAVE XCEL ENERGY'S CUSTOMER FORECASTS BEEN
5 HISTORICALLY?

6 A. Over the past five years, the total customer forecast to actual variance has
7 averaged 0.6%.

8
9 **VII. STATISTICALLY MODELED FORECASTS**

10
11 Q. PLEASE DESCRIBE THE REGRESSION MODELS AND ASSOCIATED ANALYSIS USED
12 IN XCEL ENERGY'S STATISTICAL PROJECTIONS OF SALES.

13 A. The regression models and associated analysis used in Xcel Energy's statistical
14 projections of sales is provided in Exhibit____(JM-1), Schedule 6. This
15 schedule includes, for each customer class, the models with their summary
16 statistics and output, and descriptions for each variable included in the model.

17
18 Plots of each model's estimated (fitted) sales relative to the historical actual
19 sales demonstrate how closely the models "fit" historical class sales data.
20 These plots support the linear regression function as being an appropriate
21 model selection. Each model's residual terms over time were reviewed to
22 ensure that the residual terms were randomly distributed with respect to the
23 predictor variables. Finally, comparison of each class's projected sales with
24 respect to their historical trends support the reasonableness of the modeled
25 forecasts.

26

1 Q. WHAT TECHNIQUES DID XCEL ENERGY EMPLOY TO EVALUATE THE
2 PLAUSIBILITY OF ITS QUANTITATIVE FORECASTING MODELS AND SALES
3 PROJECTIONS?

4 A. There are a number of quantitative and qualitative validity tests that are
5 applicable to OLS multiple regression analysis:

6
7 The coefficient of determination (“R-squared”) test statistic is a measure of
8 the quality of the model’s fit to the historical data. It represents the
9 proportion of the variation of the historical sales around their mean value that
10 can be attributed to the functional relationship between the historical sales
11 and the explanatory variables included in the model. If the R-squared statistic
12 is high, the model is explaining a high degree of the sales variability. The
13 regression models used to develop the sales forecast demonstrate acceptable
14 R-squared statistics, ranging between 65.2 percent and 99.8 percent, with five
15 of the seven models demonstrating R-squared statistics greater than 98.4
16 percent.

17
18 The t-statistics of the modeled variables indicate the degree of correlation
19 between that variable’s data series and the sales data series being modeled.
20 The t-statistic is a measure of the statistical significance of each variable’s
21 individual contribution to the prediction model. Generally, the absolute value
22 of each t-statistic should be greater than 2.0 to be considered statistically
23 significant at the 95 percent confidence level. This criteria was applied in the
24 development of the regression models used to develop the sales forecast. The
25 final regression models used to develop the sales forecast tested satisfactorily
26 under this standard.

27

1 Each model was inspected for the presence of first-order autocorrelation, as
2 measured by the Durbin-Watson (“DW”) test statistic. Autocorrelation refers
3 to the correlation of the model’s error terms for different time periods. For
4 example, an overestimate in one period is likely to lead to an overestimate in
5 the succeeding period, and vice versa, under the presence of first-order
6 autocorrelation. Thus, when forecasting with an OLS regression model,
7 absence of autocorrelation between the residual errors is very important. The
8 DW test statistic ranges between 0 and 4, and provides a measure to test for
9 autocorrelation. In the absence of first-order autocorrelation, the DW test
10 statistic equals 2.0. The final regression models used to develop the sales
11 forecast tested satisfactorily for the absence of first-order autocorrelation, as
12 measured by the DW test statistic.

13
14 Graphical inspection of each model’s error terms (i.e. actual less predicted)
15 was used to verify that the models were not misspecified and that statistical
16 assumptions pertaining to constant variance among the residual terms and
17 their random distribution with respect to the predictor variables were not
18 violated. Analysis of each model’s residuals indicated that the residuals were
19 homoscedastic (constant variance) and randomly distributed, indicating that
20 the OLS linear regression modeling technique was an appropriate selection
21 for each customer class’ sales that were statistically modeled.

22
23 The statistically modeled sales forecasts for each customer class have been
24 reviewed for reasonableness as compared to the respective monthly sales
25 history for that class. Graphical inspection reveals that the patterns of the
26 forecast fit well with the respective historical sales patterns for each customer
27 class. The annual total forecast sales volumes and usage per customer have

1 been compared to their respective historical trends for consistency. Similar
2 qualitative tests for reasonableness and consistency have been performed for
3 the customer level projections.
4

5 Q. WHY WAS A DIFFERENT METHODOLOGY USED TO FORECAST USAGE FOR THE
6 TRANSPORTATION CUSTOMER CLASS?

7 A. Usage in the transportation customer class is impacted by many factors, which
8 are difficult to capture in an OLS multiple regression models. Fuel switching,
9 rate changing, and production schedules vary from customer to customer,
10 making usage very volatile. Use per customer is high in these classes, and
11 changes in usage by a single customer could significantly impact the class as a
12 whole. Averaging actual sales levels over the last several years nullifies any
13 large usage swings in a given month and provides a reasonable forecast.
14

15 **VIII. WEATHER NORMALIZATION OF TEST YEAR SALES**

16

17 Q. HOW DID XCEL ENERGY ADJUST ITS TEST YEAR SALES FOR THE INFLUENCE OF
18 WEATHER ON SALES?

19 A. Residential, Small and Large Commercial, and Small Volume Interruptible
20 sales projections were developed through the application of quantitative
21 statistical models. For each of these classes, sales were not weather adjusted
22 prior to developing the respective statistical models. The respective linear
23 regression models used to forecast sales included weather, as measured in
24 terms of heating degree days, either as an explanatory variable or as a
25 predictor of the appliance usage variable. In this way, the historical weather
26 impact on historical consumption for each class was modeled through the
27 respective coefficients for the heating degree day variables or heating variable

1 included in each class' model. Test year usage was then projected by
2 simulating the established statistical relationships over the forecast horizon.
3 To accomplish this simulation, "normal" heating degree days were applied
4 based on the twenty-year moving average of historical heating degree days. In
5 this manner, the quantitatively derived test year budget sales assume weather
6 normality.

7
8 For the Large Volume Interruptible, Interdepartmental, and Transportation
9 classes, forecast volumes have not been weather normalized. These
10 customers' primary use of natural gas is not for space heating, and so many
11 other factors (for example, availability and price of alternate fuels and
12 individual company operating characteristics) contribute to these volumes. As
13 a result, the weather impact due to deviation from normal weather is
14 indistinguishable from other variables.

15
16 Q. WHAT WAS XCEL ENERGY'S MEASURE OF WEATHER AND WHAT WAS THE
17 SOURCE?

18 A. The measure of weather used was heating degree days, using a sixty-five
19 degree temperature base. This information was measured at the National
20 Oceanic and Atmospheric Administration's Fargo, North Dakota weather
21 station.

22
23 Q. DID THE WEATHER REFLECT THE SAME BILLING DAYS AS THE SALES AND
24 THROUGHPUT DATA?

25 A. Yes. The heating degree days were weighted by the number of times a
26 particular day was included in a particular billing month. These weighted

1 heating degree days were divided by the total billing cycle days to arrive at
2 average daily heating degree days for a billing month.

3
4 Q. HOW WAS NORMAL WEATHER DETERMINED?

5 A. Normal daily weather was calculated based on the average of twenty years of
6 historical heating degree days. These normal heating degree days were related
7 to the forecasted billing month in the same manner as were the actual heating
8 degree days.

9
10 **IX. DATA PREPARATION**

11
12 Q. PLEASE DESCRIBE THE DATA AND DATA SOURCES XCEL ENERGY RELIED ON
13 TO DEVELOP THE SALES AND CUSTOMERS FORECASTS.

14 A. Historical monthly billing month sales and monthly number of customers
15 were obtained from Xcel Energy's billing system. At least six years of
16 monthly historical data was obtained and used.

17
18 Q. WHAT WAS YOUR SOURCE FOR THE WEATHER DATA XCEL ENERGY RELIED
19 ON?

20 A. As explained, the measure of weather used was heating degree days, using a
21 sixty-five degree temperature base. Eight temperature readings per day were
22 obtained, and the average daily temperature was determined by averaging the
23 eight temperature readings. Heating degree days were calculated for each day
24 by subtracting the average daily temperature from 65 degrees Fahrenheit. For
25 example, if the average daily temperature was 45 degrees Fahrenheit, then 65
26 minus 45 or 20 Heating Degree Days were calculated for that day. If the
27 average daily temperature was greater than 65 degrees Fahrenheit, then that

1 day recorded zero Heating Degree Days. Normal daily heating degree days
2 were calculated by averaging twenty years of daily heating degree days using
3 data from 1986 to 2005.

4
5 Q. WHAT WAS YOUR SOURCE OF ECONOMIC AND DEMOGRAPHIC DATA?

6 A. Historical and forecasted economic and demographic variables were obtained
7 from Global Insight, Inc., a respected economic forecasting firm frequently
8 relied on by forecasting professionals. These variables include population,
9 household size, non-manufacturing employment, household income, and
10 non-manufacturing output. This information is used to determine the
11 historical relationship between customers or sales and economic and
12 demographic measures.

13
14 **X. UNBILLED SALES**

15
16 Q. CAN YOU EXPLAIN THE TERM “UNBILLED SALES”?

17 A. Yes. Xcel Energy reads natural gas meters each working day according to a
18 meter reading schedule based on twenty-one billing cycles per billing month.
19 Meters read early in the month mostly reflect consumption that occurred
20 during the previous month. Meters read late in the month mostly reflect
21 consumption that occurred during the current month. The “billing month”
22 sales for the current month reflect consumption that occurred in both the
23 previous month and the current month. Thus, billing month sales lag
24 calendar month sales. Unbilled sales are volumes of natural gas consumed in
25 the current month that are not billed to the customer until the succeeding
26 month.

1 Q. WHAT IS THE PURPOSE OF THE UNBILLED SALES ADJUSTMENT?

2 A. The purpose is to align the test year revenues with the relevant projected test
3 year expenses, which have been estimated on a calendar month basis.

4

5 Q. IS XCEL ENERGY REFLECTING UNBILLED REVENUE ON ITS BOOKS FOR
6 ACCOUNTING AND FINANCIAL PURPOSES?

7 A. Yes. Xcel Energy adopted this practice during fiscal year 1992.

8

9 Q. HOW WERE THE ESTIMATED MONTHLY NET UNBILLED SALES VOLUMES
10 DETERMINED?

11 A. Xcel Energy determined its test year monthly net unbilled sales as the
12 difference between the estimated monthly calendar month sales, and the
13 projected billing month sales. The projected billing month sales were created
14 using the statistical models and other forecasting methods previously
15 described.

16

17 **XI. CALENDAR MONTH SALES DERIVATION**

18

19 Q. HOW WERE THE ESTIMATED MONTHLY CALENDAR MONTH SALES VOLUMES
20 DETERMINED?

21 A. For the Residential, Small and Large Commercial, and Small Volume
22 Interruptible classes, Xcel Energy calculated the test year calendar month sales
23 based on the projected billing month sales. The test year calendar month
24 sales volumes were calculated in terms of their sales load component that is
25 not associated with weather (“base load”), and their sales load component
26 that is influenced by weather (“total weather load”). The weather was
27 measured in terms of normal heating degree days, as described above. The

1 base load sales and the total weather sales components were calculated for
2 each class. The two components were then combined to provide the total
3 calendar month volumes.

4
5 The calendar month base load component was calculated as follows:

6 *Step 1* – The billing month based total weather load was calculated. This was
7 accomplished by multiplying the billing month sales weather normalization
8 regression coefficient (defined in terms of billing month heating degree days
9 and number of customers), times billing month normal heating degree days,
10 times the projected customers.

11 *Step 2* – The billing month base load was calculated by taking the difference
12 between the projected total billing month sales and the billing month based
13 total weather load (calculated in Step 1).

14 *Step 3* – The billing month base load sales per billing day was determined by
15 dividing the billing month base load sales (from Step 2) by the average
16 number of billing days per billing month.

17 *Step 4* – The calendar month base load sales were then calculated by
18 multiplying the billing month base load sales per billing day (from Step 3)
19 times the number of days in the calendar month.

20
21 The calendar month total weather sales component was calculated the same
22 way the billing month total weather load was calculated (as described in Step
23 1). However, the calculation was performed by substituting the calendar
24 month sales weather normalization regression coefficient (defined in terms of
25 calendar month heating degree days and number of customers) and the
26 calendar month normal heating degree days.

27

1 The calendar month total sales were calculated by combining the calendar
2 month base load and total weather sales components.

3
4 For the Large Volume Interruptible class, Xcel Energy calculated the test year
5 calendar month sales based on the projected billing month sales in the same
6 manner as detailed for Residential, Small and Large Commercial, and Small
7 Volume Interruptible sales. However, for the Large Volume Interruptible
8 class, there are no total weather load sales. The test year calendar month total
9 sales for this class were calculated only in terms of their base load, where the
10 billing month base load equaled the projected billing month sales.

11
12 The Interdepartmental, and Transportation classes are billed on a calendar
13 month basis. Therefore, for these classes the calendar month sales equal the
14 billing month sales.

15 16 XII. CONCLUSION

17
18 Q. IN YOUR OPINION, DOES THE XCEL ENERGY SALES AND TRANSPORTATION
19 FORECAST PROVIDE A REASONABLE BASIS FOR ESTABLISHING RATES IN THIS
20 CASE?

21 A. Yes. The forecast data is a reasonable estimate of test year sales volumes and
22 supports the test year revenue projections.

23
24 Q. DOES THIS CONCLUDE YOUR TESTIMONY ON SALES FORECASTING?

25 A. Yes, it does.

26

1
2 STATE OF NORTH DAKOTA
3 BEFORE THE
4 PUBLIC SERVICE COMMISSION
5
6

7 In the Matter of the Application of Northern)
8 States Power Company, a Minnesota corporation) Notice of Change in Rates
9 and wholly owned Subsidiary of Xcel Energy Inc.)
10 for Authority to Increase Rates For Natural Gas) Case No. PU-06-____
11 Service in North Dakota)
12
13
14

15 AFFIDAVIT OF
16 Jannell Marks
17
18

19 I, the undersigned, being duly sworn, depose and say that the foregoing is
20 the Direct Testimony of the undersigned, and that such Direct Testimony and the
21 exhibits or schedules sponsored by me to the best of my knowledge, information
22 and belief, are true, correct, accurate and complete, and I hereby adopt said
23 testimony as if given by me in formal hearing, under oath.
24
25

26 Jannell Marks
27 Jannell Marks
28
29
30
31

32 Subscribed and sworn to before me, this 12th day of December, 2006.
33
34

35 Schuna D. Wright
36 Notary Public
37
38



Jannell Marks
Manager, Energy Forecasting
1225 17th Street, Denver, Colorado 80202

August 2000 – Present

Manager, Energy Forecasting, Xcel Energy

Responsible for the development and presentation of forecasted data for Xcel Energy's operating companies. Also responsible for reporting historical and statistical information to various regulatory agencies and others. Testified on forecasting issues before the Public Utility Commission of Texas, the Colorado Public Utilities Commission, and the Minnesota Public Utilities Commission.

May 1997 – August 2000

Manager, Demand, Energy and Customer Forecasts, New Century Energies, Inc.

Responsible for developing demand, energy, and customer forecasts for New Century Energies, Inc.'s operating companies. Also directed the preparation of statistical reporting for regulatory agencies and others regarding historical and forecasted reports. Testified on forecasting issues before the Public Utility Commission of Texas and the Colorado Public Utilities Commission.

1991-1997

Senior Research Analyst, Public Service Company of Colorado

Responsible for developing the customer and sales forecasts for Public Service Company of Colorado and the economic, customer, sales and demand forecasts for Cheyenne Light, Fuel and Power Company.

1982-1991

Research Analyst, Public Service Company of Colorado

Education

Colorado State University – Bachelor of Science: Statistics

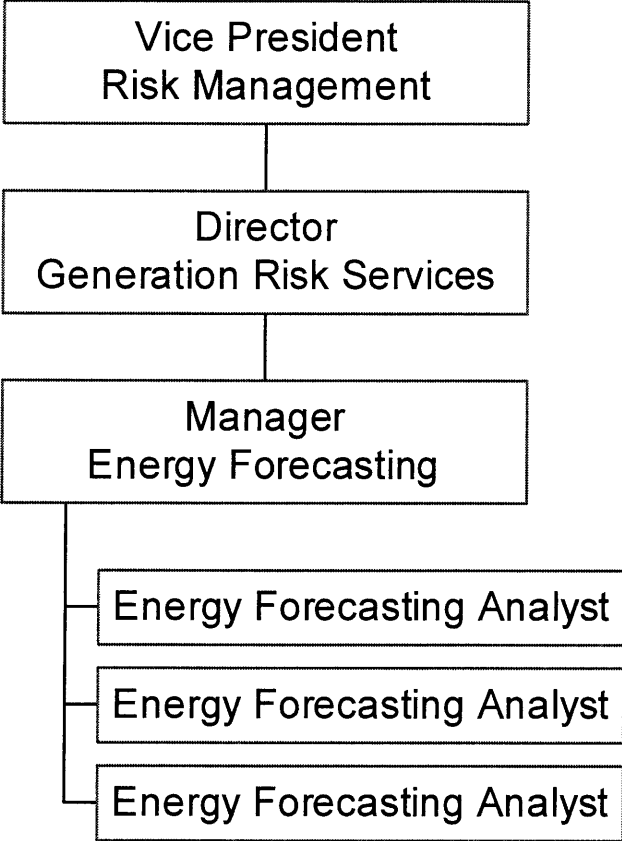
1982

Training and Professional Associations

I have attended the Institute for Professional Education's Economic Modeling and Forecasting Class; Itron's Forecasting Workshops; and the Electric Power Research Institute's REEPS (Residential End-Use Energy Planning System), COMMEND (Commercial End-Use Planning System), and INFORM (Industrial End-Use Forecasting Model) Training Classes and User Group Meetings.

I am a member of Itron's Energy Forecasting Group.

Organization Chart



Definitions of Terms

Base Load - Component of sales not associated with weather.

Billing Days - Based on the meter reading schedule for the 21 billing cycles. For example, there are approximately 651 (21 cycles * 31 days) billing days during a typical billing month period.

Billing Month Sales - Billed sales based on the meter reading schedule for the 21 billing cycles.

Calendar Month Sales - Estimated sales, equal to the billing month sales, adjusted for the estimated unbilled sales of the current calendar month, less the estimated unbilled sales from the previous calendar month.

Dkt - Dekatherm; Measure of gas sales. One (1) Dkt = ten (10) therms.

DW Test Statistic - Durbin-Watson test statistic; tests for the presence of first-order autocorrelation. In the absence of first-order autocorrelation, the statistic equals 2.0.

Error Terms - The difference between the actual values of the data series being modeled (customers or sales) and the regression model's predicted, or "fitted" values for that series. Also called Residual Terms.

Heating Degree Days - Measure of weather. Calculated by subtracting the average daily temperature from a base of 65 degrees Fahrenheit.

Mcf - Measure of gas sales. One (1) Mcf = one thousand (1,000) cubic feet.

OLS Multiple Regression - Ordinary Least Squares Linear Regression employing multiple independent variables to model the variation of the dependent variable about its mean value.

R-squared - Coefficient of determination; measures the quality of the model's fit to the historical data. The higher the R-squared statistic, the better the model is explaining the historical data.

Definitions of Terms (continued)

Residual Terms - The difference between the actual values of the data series being modeled (customers or sales) and the regression model's predicted, or "fitted" values for that series. Also called Error Terms.

SAE – Statistically-Adjusted End-Use modeling approach, which entails specifying energy usage as a function of the primary end-use variables (heating and base use), and the factors that affect these end-use energy requirements.

t-Statistic - Measures the importance of the independent variable to the regression. The higher the absolute value of the t-statistic, the more likely it is that the variable has a relationship to the dependent variable and is making an important contribution to the equation.

Test Year – January 1, 2007-December 31, 2007.

Total Weather Load - Component of sales influenced by weather.

Customer Models

Number of Residential Gas Customers

REGRESSION PERIOD: Jan 1998 – Dec 2005

NUMBER OF OBSERVATIONS: 96

LINEAR LEAST SQUARES MODEL WITH ARMA ERRORS

Residential Customers = C1*Population + C2*January + C3*February + C4*March +
 C5*April + C6*May + C7*June + C8*July + C9*August + C10*September +
 C11*October + C12*November + C13*December + C14*AR(1)

	Variable	Coefficient	StdErr	T-Stat	P-Value
C1	Population	22.125	4.061	5.449	0.00%
C2	January	-77837.524	20704.019	-3.760	0.03%
C3	February	-78076.927	20732.917	-3.766	0.03%
C4	March	-78018.457	20715.805	-3.766	0.03%
C5	April	-78224.745	20714.816	-3.776	0.03%
C6	May	-78237.326	20698.748	-3.780	0.03%
C7	June	-78181.532	20683.182	-3.780	0.03%
C8	July	-78186.062	20682.870	-3.780	0.03%
C9	August	-78106.097	20668.266	-3.779	0.03%
C10	September	-78117.560	20669.717	-3.779	0.03%
C11	October	-77945.893	20670.824	-3.771	0.03%
C12	November	-77827.474	20673.160	-3.765	0.03%
C13	December	-77840.829	20704.729	-3.760	0.03%
C14	AR(1)	0.957	0.033	29.247	0.00%

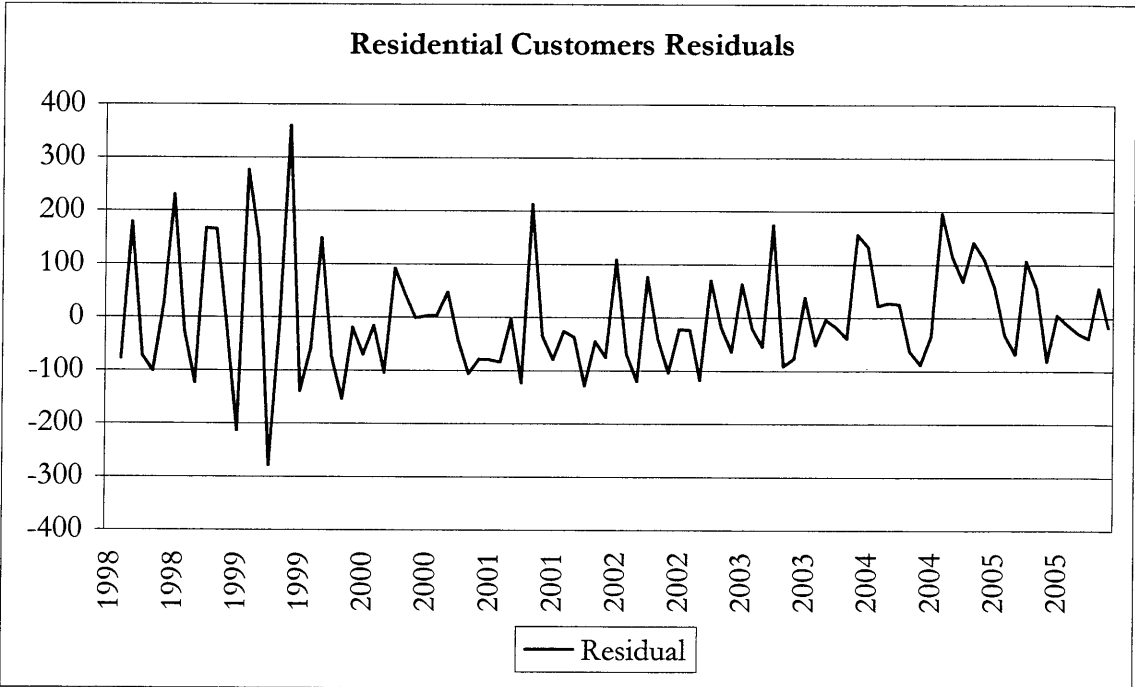
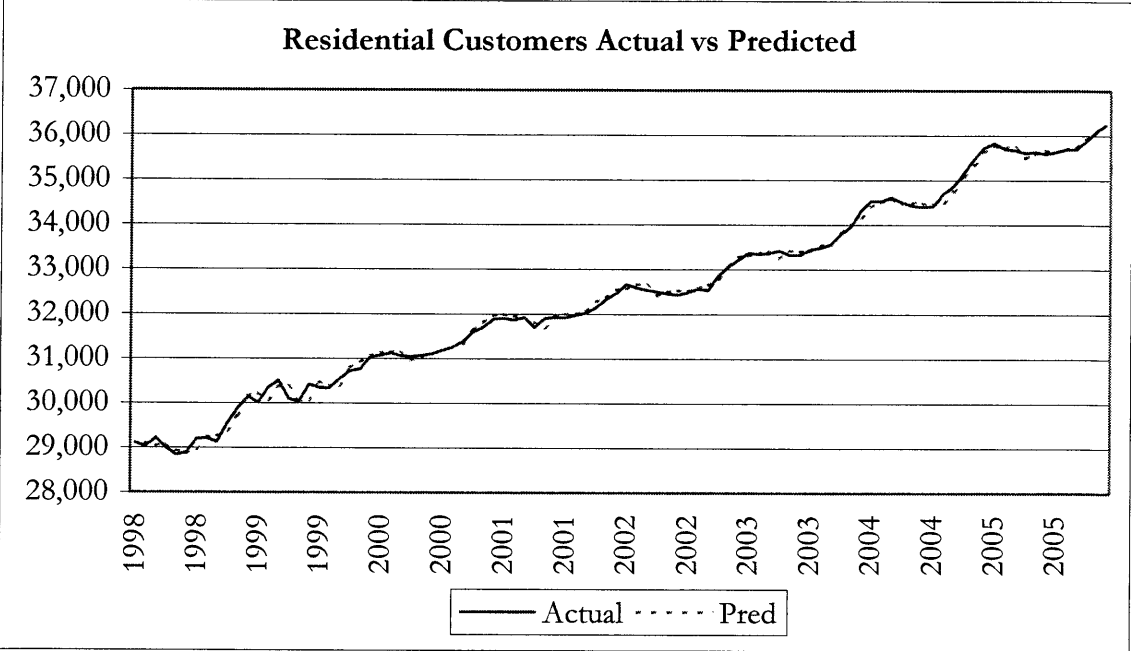
Regression Statistics	
Iterations	11
Adjusted Observations	95
Deg. of Freedom for Error	81
R-Squared	0.997
Adjusted R-Squared	0.997
Durbin-Watson Statistic	2.145
AIC	9.626
BIC	10.002
F-Statistic	2148.449
Prob (F-Statistic)	0.0000
Log-Likelihood	-571.95
Model Sum of Squares	398139867
Sum of Squared Errors	1072180
Mean Squared Error	13236.79
Std. Error of Regression	115.05
Mean Abs. Dev. (MAD)	82.23
Mean Abs. % Err. (MAPE)	0.26%
Ljung-Box Statistic	74.08
Prob (Ljung-Box)	0.0000

Variable	Description
Population	Minnesota population
January	Binary variable for January
February	Binary variable for February
March	Binary variable for March
April	Binary variable for April
May	Binary variable for May
June	Binary variable for June
July	Binary variable for July
August	Binary variable for August
September	Binary variable for September
October	Binary variable for October
November	Binary variable for November
December	Binary variable for December
AR(1)	ARMA (1,0) term applied to model errors

Year	Month	Actual	Predicted	Residual	% Residual
1998	1	29,112.000			
1998	2	29,028.000	29,105.988	-77.988	-0.27%
1998	3	29,227.000	29,048.698	178.302	0.61%
1998	4	28,997.000	29,069.531	-72.531	-0.25%
1998	5	28,844.000	28,945.613	-101.613	-0.35%
1998	6	28,894.000	28,866.981	27.019	0.09%
1998	7	29,197.000	28,967.144	229.856	0.79%
1998	8	29,210.000	29,235.978	-25.978	-0.09%
1998	9	29,129.000	29,252.998	-123.998	-0.43%
1998	10	29,547.000	29,380.041	166.959	0.57%
1998	11	29,886.000	29,721.007	164.993	0.55%
1998	12	30,149.000	30,161.923	-12.923	-0.04%
1999	1	30,010.000	30,223.128	-213.128	-0.71%
1999	2	30,350.000	30,073.049	276.951	0.91%
1999	3	30,513.000	30,368.607	144.393	0.47%
1999	4	30,095.000	30,373.655	-278.655	-0.93%
1999	5	30,036.000	30,051.880	-15.880	-0.05%
1999	6	30,423.000	30,063.236	359.764	1.18%
1999	7	30,347.000	30,486.385	-139.385	-0.46%
1999	8	30,332.000	30,392.042	-60.042	-0.20%
1999	9	30,550.000	30,400.936	149.064	0.49%
1999	10	30,721.000	30,796.704	-75.704	-0.25%
1999	11	30,766.000	30,919.538	-153.538	-0.50%
1999	12	31,043.000	31,062.232	-19.232	-0.06%
2000	1	31,066.000	31,136.145	-70.145	-0.23%
2000	2	31,126.000	31,141.908	-15.908	-0.05%
2000	3	31,064.000	31,168.356	-104.356	-0.34%
2000	4	31,050.000	30,958.374	91.626	0.30%
2000	5	31,066.000	31,023.004	42.996	0.14%
2000	6	31,105.000	31,106.159	-1.159	0.00%
2000	7	31,183.000	31,180.898	2.102	0.01%
2000	8	31,252.000	31,248.594	3.406	0.01%
2000	9	31,386.000	31,338.268	47.732	0.15%
2000	10	31,594.000	31,637.916	-43.916	-0.14%
2000	11	31,705.000	31,811.236	-106.236	-0.34%
2000	12	31,892.000	31,970.696	-78.696	-0.25%

Year	Month	Actual	Predicted	Residual	% Residual
2001	1	31,907.000	31,987.105	-80.105	-0.25%
2001	2	31,870.000	31,953.930	-83.930	-0.26%
2001	3	31,929.000	31,931.619	-2.619	-0.01%
2001	4	31,699.000	31,821.934	-122.934	-0.39%
2001	5	31,907.000	31,694.659	212.341	0.67%
2001	6	31,927.000	31,961.617	-34.617	-0.11%
2001	7	31,916.000	31,995.280	-79.280	-0.25%
2001	8	31,974.000	31,999.686	-25.686	-0.08%
2001	9	32,026.000	32,063.292	-37.292	-0.12%
2001	10	32,148.000	32,276.319	-128.319	-0.40%
2001	11	32,329.000	32,373.787	-44.787	-0.14%
2001	12	32,471.000	32,546.147	-75.147	-0.23%
2002	1	32,671.000	32,562.415	108.585	0.33%
2002	2	32,591.000	32,659.474	-68.474	-0.21%
2002	3	32,542.000	32,662.039	-120.039	-0.37%
2002	4	32,502.000	32,425.754	76.246	0.23%
2002	5	32,463.000	32,502.588	-39.588	-0.12%
2002	6	32,429.000	32,533.090	-104.090	-0.32%
2002	7	32,492.000	32,514.466	-22.466	-0.07%
2002	8	32,567.000	32,590.280	-23.280	-0.07%
2002	9	32,529.000	32,646.950	-117.950	-0.36%
2002	10	32,865.000	32,795.443	69.557	0.21%
2002	11	33,057.000	33,075.136	-18.136	-0.05%
2002	12	33,214.000	33,278.459	-64.459	-0.19%
2003	1	33,373.000	33,310.198	62.802	0.19%
2003	2	33,346.000	33,366.794	-20.794	-0.06%
2003	3	33,367.000	33,421.808	-54.808	-0.16%
2003	4	33,426.000	33,251.932	174.068	0.52%
2003	5	33,333.000	33,424.117	-91.117	-0.27%
2003	6	33,326.000	33,402.924	-76.924	-0.23%
2003	7	33,444.000	33,405.922	38.078	0.11%
2003	8	33,487.000	33,538.433	-51.433	-0.15%
2003	9	33,560.000	33,563.866	-3.866	-0.01%
2003	10	33,797.000	33,814.957	-17.957	-0.05%
2003	11	33,964.000	34,003.333	-39.333	-0.12%
2003	12	34,327.000	34,170.576	156.424	0.46%

Year	Month	Actual	Predicted	Residual	% Residual
2004	1	34,541.000	34,407.445	133.555	0.39%
2004	2	34,530.000	34,508.045	21.955	0.06%
2004	3	34,618.000	34,590.557	27.443	0.08%
2004	4	34,506.000	34,480.546	25.454	0.07%
2004	5	34,430.000	34,493.123	-63.123	-0.18%
2004	6	34,400.000	34,488.205	-88.205	-0.26%
2004	7	34,422.000	34,456.330	-34.330	-0.10%
2004	8	34,705.000	34,509.245	195.755	0.56%
2004	9	34,875.000	34,760.158	114.842	0.33%
2004	10	35,164.000	35,095.303	68.697	0.20%
2004	11	35,483.000	35,341.531	141.469	0.40%
2004	12	35,731.000	35,619.687	111.313	0.31%
2005	1	35,829.000	35,770.565	58.435	0.16%
2005	2	35,702.000	35,733.812	-31.812	-0.09%
2005	3	35,674.000	35,742.316	-68.316	-0.19%
2005	4	35,615.000	35,508.274	106.726	0.30%
2005	5	35,640.000	35,584.017	55.983	0.16%
2005	6	35,594.000	35,675.788	-81.788	-0.23%
2005	7	35,640.000	35,634.576	5.424	0.02%
2005	8	35,692.000	35,704.741	-12.741	-0.04%
2005	9	35,693.000	35,721.532	-28.532	-0.08%
2005	10	35,874.000	35,913.318	-39.318	-0.11%
2005	11	36,093.000	36,037.431	55.569	0.15%
2005	12	36,233.000	36,250.279	-17.279	-0.05%



Number of Small and Large Commercial and Industrial Gas Customers

REGRESSION PERIOD: Jan 2000 – Oct 2006

NUMBER OF OBSERVATIONS: 82

LINEAR LEAST SQUARES MODEL

Small and Large Commercial and Industrial Customers = C1 + C2*NonManEmp +
 C3*September + C4*October + C5*PlusYr2002 + C6*CRSCust + C7*AR(1)

	Variable	Coefficient	StdErr	T-Stat	P-Value
C1	CONST	-6518.927	1277.023	-5.105	0.00%
C2	NonManEmp	39.858	4.163	9.574	0.00%
C3	September	-41.983	13.405	-3.132	0.25%
C4	October	-47.033	13.713	-3.430	0.10%
C5	PlusYr2002	223.555	31.812	7.027	0.00%
C6	CRSCust	-214.722	38.672	-5.552	0.00%
C7	AR(1)	0.728	0.079	9.200	0.00%

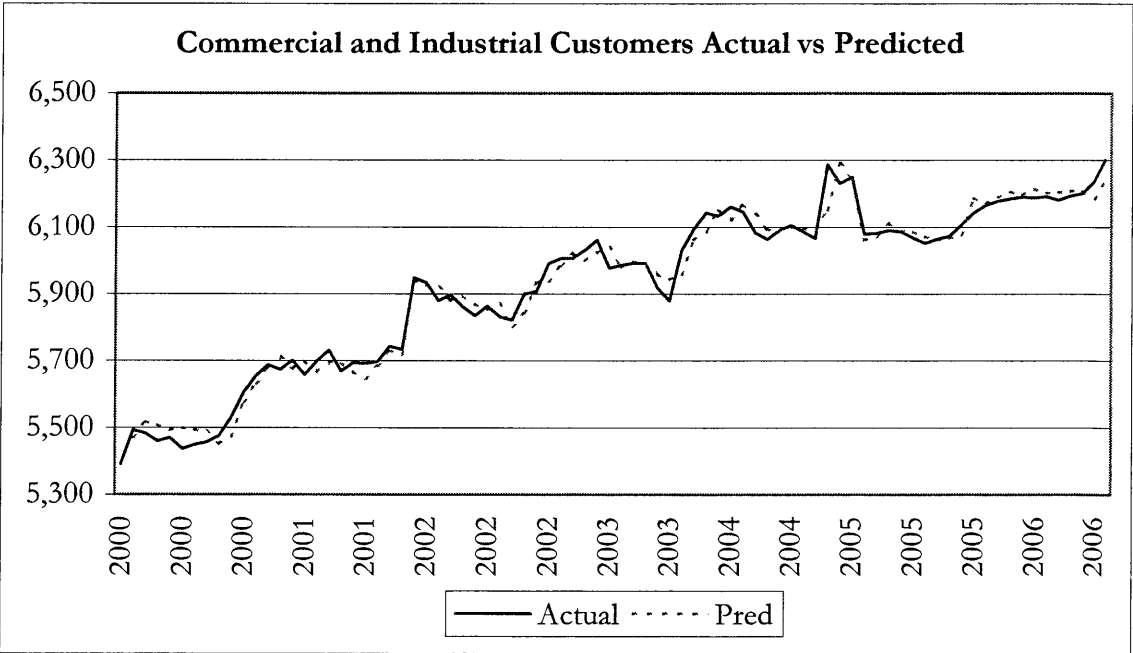
Regression Statistics	
Iterations	8
Adjusted Observations	81
Deg. of Freedom for Error	74
R-Squared	0.977
Adjusted R-Squared	0.975
Durbin-Watson Statistic	1.986
AIC	7.333
BIC	7.540
F-Statistic	528.917
Prob (F-Statistic)	0.0000
Log-Likelihood	-399.91
Model Sum of Squares	4469557
Sum of Squared Errors	104222
Mean Squared Error	1408.40
Std. Error of Regression	37.53
Mean Abs. Dev. (MAD)	28.71
Mean Abs. % Err. (MAPE)	0.49%
Ljung-Box Statistic	32.33
Prob (Ljung-Box)	0.1189

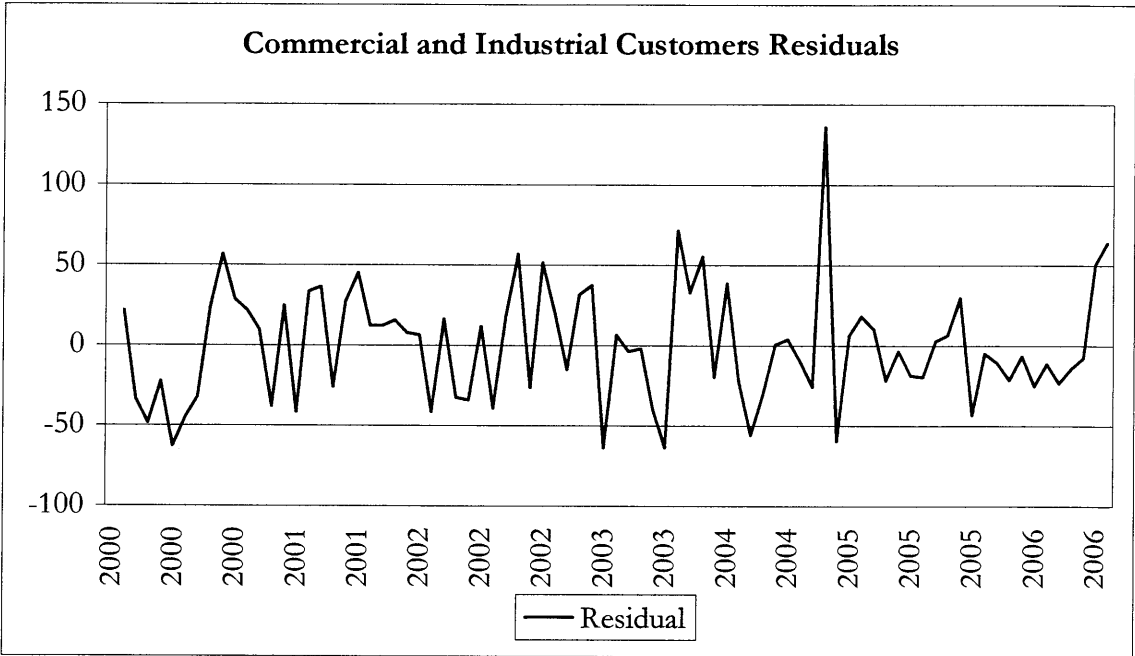
Variable	Description
CONST	Constant term
NonManEmp	North Dakota non-manufacturing employment
September	Binary variable for September
October	Binary variable for October
PlusYr2002	Binary variable for customer reclassification in January 2002
CRSCust	Binary variable for implementation of CRS Billing System in February 2005
AR(1)	ARMA (1,0) term applied to model errors

Year	Month	Actual	Predicted	Residual	% Residual
2000	1	5,391.000			
2000	2	5,493.000	5,471.348	21.652	0.39%
2000	3	5,483.000	5,516.543	-33.543	-0.61%
2000	4	5,460.000	5,508.381	-48.381	-0.89%
2000	5	5,470.000	5,492.267	-22.267	-0.41%
2000	6	5,437.000	5,499.551	-62.551	-1.15%
2000	7	5,449.000	5,493.774	-44.774	-0.82%
2000	8	5,457.000	5,489.214	-32.214	-0.59%
2000	9	5,476.000	5,452.180	23.820	0.43%
2000	10	5,530.000	5,473.123	56.877	1.03%
2000	11	5,605.000	5,576.178	28.822	0.51%
2000	12	5,654.000	5,632.224	21.776	0.39%
2001	1	5,688.000	5,678.239	9.761	0.17%
2001	2	5,674.000	5,711.932	-37.932	-0.67%
2001	3	5,701.000	5,676.214	24.786	0.43%
2001	4	5,658.000	5,699.528	-41.528	-0.73%
2001	5	5,699.000	5,665.550	33.450	0.59%
2001	6	5,732.000	5,695.415	36.585	0.64%
2001	7	5,669.000	5,694.816	-25.816	-0.46%
2001	8	5,694.000	5,666.872	27.128	0.48%
2001	9	5,692.000	5,646.745	45.255	0.80%
2001	10	5,697.000	5,684.634	12.366	0.22%
2001	11	5,743.000	5,730.636	12.364	0.22%
2001	12	5,734.000	5,718.305	15.695	0.27%
2002	1	5,949.000	5,941.046	7.954	0.13%
2002	2	5,933.000	5,926.444	6.556	0.11%
2002	3	5,880.000	5,921.289	-41.289	-0.70%

Year	Month	Actual	Predicted	Residual	% Residual
2002	4	5,897.000	5,880.500	16.500	0.28%
2002	5	5,862.000	5,894.473	-32.473	-0.55%
2002	6	5,835.000	5,868.979	-33.979	-0.58%
2002	7	5,864.000	5,852.197	11.803	0.20%
2002	8	5,832.000	5,871.219	-39.219	-0.67%
2002	9	5,822.000	5,803.744	18.256	0.31%
2002	10	5,900.000	5,843.094	56.906	0.96%
2002	11	5,908.000	5,934.224	-26.224	-0.44%
2002	12	5,991.000	5,939.303	51.697	0.86%
2003	1	6,006.000	5,986.032	19.968	0.33%
2003	2	6,007.000	6,021.942	-14.942	-0.25%
2003	3	6,031.000	5,999.420	31.580	0.52%
2003	4	6,061.000	6,023.509	37.491	0.62%
2003	5	5,977.000	6,040.548	-63.548	-1.06%
2003	6	5,986.000	5,979.362	6.638	0.11%
2003	7	5,993.000	5,996.580	-3.580	-0.06%
2003	8	5,992.000	5,993.912	-1.912	-0.03%
2003	9	5,918.000	5,957.810	-39.810	-0.67%
2003	10	5,879.000	5,942.661	-63.661	-1.08%
2003	11	6,030.000	5,958.435	71.565	1.19%
2003	12	6,094.000	6,061.021	32.979	0.54%
2004	1	6,143.000	6,087.541	55.459	0.90%
2004	2	6,133.000	6,152.739	-19.739	-0.32%
2004	3	6,161.000	6,122.387	38.613	0.63%
2004	4	6,146.000	6,168.345	-22.345	-0.36%
2004	5	6,083.000	6,138.799	-55.799	-0.92%
2004	6	6,063.000	6,092.909	-29.909	-0.49%
2004	7	6,090.000	6,089.403	0.597	0.01%
2004	8	6,105.000	6,101.013	3.987	0.07%
2004	9	6,086.000	6,095.519	-9.519	-0.16%
2004	10	6,066.000	6,091.750	-25.750	-0.42%
2004	11	6,287.000	6,151.154	135.846	2.16%
2004	12	6,231.000	6,290.440	-59.440	-0.95%
2005	1	6,250.000	6,243.898	6.102	0.10%
2005	2	6,080.000	6,061.845	18.155	0.30%
2005	3	6,082.000	6,071.704	10.296	0.17%
2005	4	6,090.000	6,111.612	-21.612	-0.35%
2005	5	6,086.000	6,089.431	-3.431	-0.06%
2005	6	6,068.000	6,086.517	-18.517	-0.31%

Year	Month	Actual	Predicted	Residual	% Residual
2005	7	6,052.000	6,071.508	-19.508	-0.32%
2005	8	6,064.000	6,061.236	2.764	0.05%
2005	9	6,073.000	6,066.445	6.555	0.11%
2005	10	6,107.000	6,077.146	29.854	0.49%
2005	11	6,143.000	6,186.250	-43.250	-0.70%
2005	12	6,166.000	6,170.874	-4.874	-0.08%
2006	1	6,178.000	6,188.516	-10.516	-0.17%
2006	2	6,185.000	6,206.312	-21.312	-0.34%
2006	3	6,190.000	6,196.356	-6.356	-0.10%
2006	4	6,188.000	6,213.147	-25.147	-0.41%
2006	5	6,191.000	6,202.112	-11.112	-0.18%
2006	6	6,181.000	6,204.298	-23.298	-0.38%
2006	7	6,193.000	6,207.217	-14.217	-0.23%
2006	8	6,201.000	6,208.526	-7.526	-0.12%
2006	9	6,236.000	6,185.520	50.480	0.81%
2006	10	6,301.000	6,237.119	63.881	1.01%





Use per Customer and Sales Models

Residential Gas Use per Customer

REGRESSION PERIOD: Jan 2000 – Dec 2005

NUMBER OF OBSERVATIONS: 72

LINEAR LEAST SQUARES MODEL WITH ARMA ERRORS

Residential Use per Customer = C1 + C2*XHt_Jan + C3*XHt_Feb + C4*XHt_Mar +
 C5*XHt_Apr + C6*XHt_May + C7*XHt_Jun + C8*XHt_Oct + C9*XHt_Nov +
 C10*XHt_Dec + C11*Feb01 + C12*Mar00 + C13*MA(1)

	Variable	Coefficient	StdErr	T-Stat	P-Value
C1	CONST	1.308	0.077	16.977	0.00%
C2	XHt_Jan	0.914	0.008	115.428	0.00%
C3	XHt_Feb	0.925	0.009	100.123	0.00%
C4	XHt_Mar	0.893	0.011	84.514	0.00%
C5	XHt_Apr	0.835	0.016	53.335	0.00%
C6	XHt_May	0.714	0.029	24.440	0.00%
C7	XHt_Jun	0.562	0.064	8.821	0.00%
C8	XHt_Oct	0.440	0.032	13.672	0.00%
C9	XHt_Nov	0.715	0.019	38.461	0.00%
C10	XHt_Dec	0.854	0.010	82.989	0.00%
C11	Feb01	-0.559	0.261	-2.137	3.69%
C12	Mar00	-0.666	0.252	-2.644	1.06%
C13	MA(1)	0.431	0.124	3.477	0.10%

Regression Statistics	
Iterations	10
Adjusted Observations	72
Deg. of Freedom for Error	59
R-Squared	0.998
Adjusted R-Squared	0.998
Durbin-Watson Statistic	1.971
AIC	-2.530
BIC	-2.119
F-Statistic	2914.314
Prob (F-Statistic)	0.0000
Log-Likelihood	1.93
Model Sum of Squares	2369
Sum of Squared Errors	4
Mean Squared Error	0.07
Std. Error of Regression	0.26
Mean Abs. Dev. (MAD)	0.18
Mean Abs. % Err. (MAPE)	4.94%
Ljung-Box Statistic	17.89
Prob (Ljung-Box)	0.8085

Variable	Description
CONST	Constant term
XHt_Jan	January Heating (Heating Equipment Index * Heating Use)
XHt_Feb	February Heating (Heating Equipment Index * Heating Use)
XHt_Mar	March Heating (Heating Equipment Index * Heating Use)
XHt_Apr	April Heating (Heating Equipment Index * Heating Use)
XHt_May	May Heating (Heating Equipment Index * Heating Use)
XHt_Jun	June Heating (Heating Equipment Index * Heating Use)
XHt_Oct	October Heating (Heating Equipment Index * Heating Use)
XHt_Nov	November Heating (Heating Equipment Index * Heating Use)
XHt_Dec	December Heating (Heating Equipment Index * Heating Use)
Feb01	Binary variable for February 2001
Mar00	Binary variable for March 2000
MA(1)	ARMA(0,1) process applied to errors

Year	Month	Actual	Predicted	Residual	% Residual
2000	1	17.221	17.201	0.019	0.11%
2000	2	15.681	15.744	-0.063	-0.40%
2000	3	10.502	10.496	0.005	0.05%
2000	4	8.678	8.657	0.021	0.24%
2000	5	4.365	4.451	-0.086	-1.98%
2000	6	2.394	2.483	-0.090	-3.74%
2000	7	1.506	1.269	0.237	15.71%
2000	8	1.213	1.410	-0.197	-16.23%
2000	9	1.472	1.223	0.249	16.90%
2000	10	3.446	3.300	0.146	4.24%
2000	11	6.259	6.291	-0.032	-0.51%
2000	12	15.586	15.782	-0.196	-1.26%
2001	1	19.309	19.432	-0.124	-0.64%
2001	2	15.646	15.888	-0.242	-1.55%
2001	3	14.111	14.877	-0.766	-5.43%
2001	4	9.153	9.344	-0.191	-2.08%
2001	5	4.472	3.975	0.497	11.11%
2001	6	2.127	2.410	-0.283	-13.32%
2001	7	1.251	1.186	0.065	5.18%
2001	8	1.125	1.336	-0.211	-18.80%
2001	9	1.305	1.217	0.088	6.72%
2001	10	2.714	2.976	-0.262	-9.66%
2001	11	6.002	5.999	0.003	0.06%
2001	12	10.317	10.527	-0.210	-2.03%
2002	1	14.965	15.392	-0.427	-2.85%
2002	2	13.976	14.051	-0.076	-0.54%
2002	3	13.328	13.512	-0.184	-1.38%
2002	4	10.393	10.083	0.310	2.99%
2002	5	6.003	5.890	0.113	1.89%
2002	6	2.761	2.469	0.293	10.60%
2002	7	1.306	1.434	-0.128	-9.84%
2002	8	1.197	1.253	-0.056	-4.68%
2002	9	1.253	1.284	-0.031	-2.47%
2002	10	3.529	3.354	0.175	4.96%
2002	11	8.659	8.311	0.348	4.02%
2002	12	12.892	12.913	-0.022	-0.17%

Year	Month	Actual	Predicted	Residual	% Residual
2003	1	15.672	15.914	-0.242	-1.54%
2003	2	16.990	16.847	0.144	0.85%
2003	3	15.711	15.151	0.561	3.57%
2003	4	8.201	8.216	-0.015	-0.18%
2003	5	4.137	4.172	-0.035	-0.86%
2003	6	2.098	2.150	-0.052	-2.45%
2003	7	1.391	1.286	0.105	7.54%
2003	8	1.163	1.353	-0.190	-16.34%
2003	9	1.323	1.226	0.097	7.32%
2003	10	2.821	2.867	-0.046	-1.65%
2003	11	7.244	7.052	0.191	2.64%
2003	12	13.029	12.710	0.319	2.45%
2004	1	16.316	16.261	0.055	0.34%
2004	2	17.468	17.264	0.203	1.16%
2004	3	11.419	11.306	0.113	0.99%
2004	4	7.872	7.850	0.022	0.28%
2004	5	4.739	4.728	0.011	0.24%
2004	6	2.673	2.539	0.134	5.02%
2004	7	1.535	1.366	0.169	10.99%
2004	8	1.274	1.381	-0.106	-8.34%
2004	9	1.427	1.262	0.164	11.52%
2004	10	2.627	2.652	-0.025	-0.97%
2004	11	5.533	5.860	-0.326	-5.90%
2004	12	11.120	11.349	-0.229	-2.06%
2005	1	18.256	17.613	0.643	3.52%
2005	2	14.272	14.230	0.041	0.29%
2005	3	12.589	12.262	0.327	2.60%
2005	4	7.256	7.317	-0.062	-0.85%
2005	5	4.160	4.542	-0.383	-9.20%
2005	6	2.300	2.011	0.289	12.58%
2005	7	1.247	1.433	-0.186	-14.90%
2005	8	1.173	1.228	-0.055	-4.67%
2005	9	1.126	1.284	-0.158	-14.04%
2005	10	2.416	2.497	-0.081	-3.34%
2005	11	5.073	5.479	-0.406	-8.01%
2005	12	11.855	11.558	0.296	2.50%

Commercial and Industrial Gas Use per Customer

REGRESSION PERIOD: Jan 2001 – Oct 2006

NUMBER OF OBSERVATIONS: 70

LINEAR LEAST SQUARES MODEL WITH ARMA ERRORS

$$\text{Commercial Use per Customer} = C1 * \text{XHt_Jan} + C2 * \text{XHt_Feb} + C3 * \text{XHt_Mar} + C4 * \text{XHt_Apr} + C5 * \text{XHt_May} + C6 * \text{XHt_Jun} + C7 * \text{XHt_Oct} + C8 * \text{XHt_Nov} + C9 * \text{XHt_Dec} + C10 * \text{XOther} + C11 * \text{Jan01} + C12 * \text{Feb05} + C13 * \text{AR}(1)$$

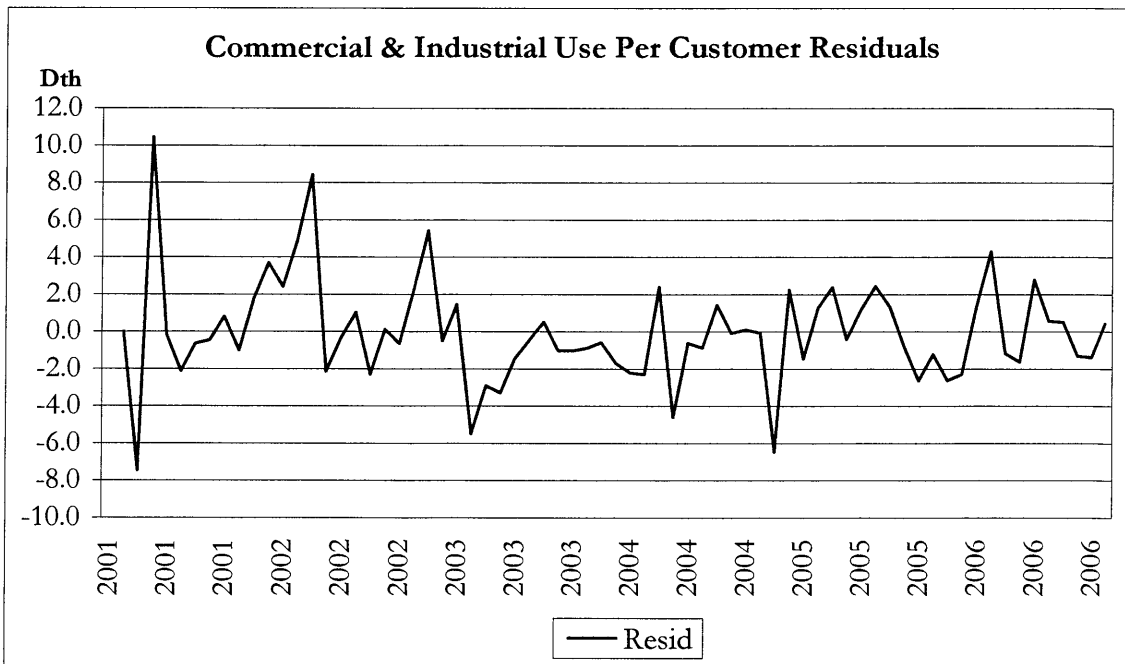
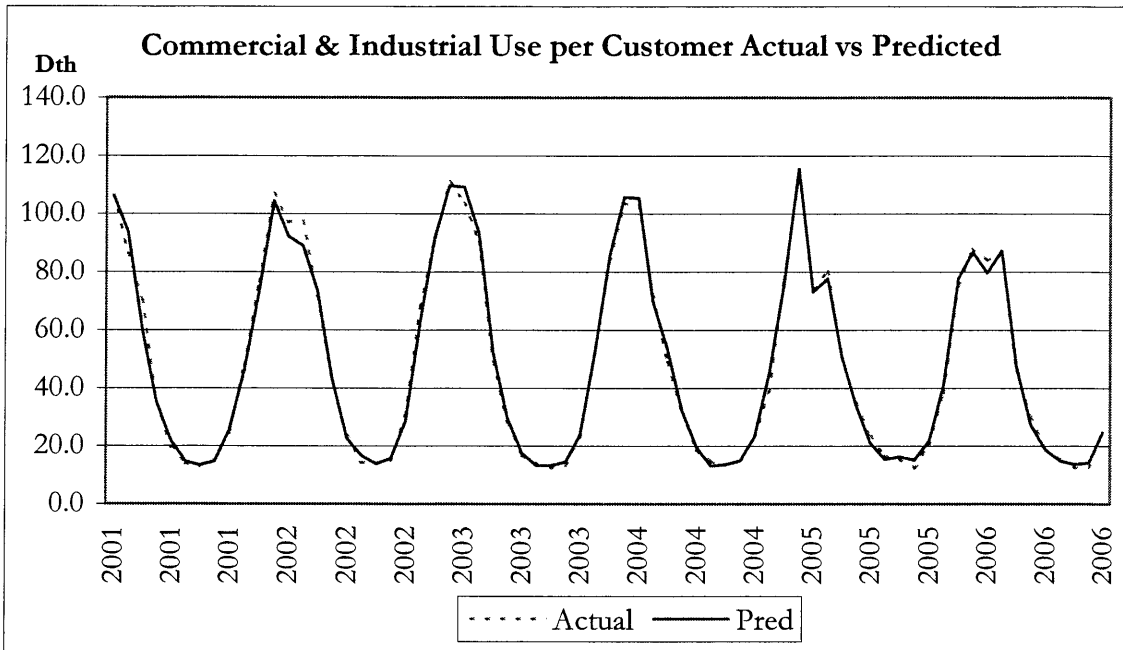
	Variable	Coefficient	StdErr	T-Stat	P-Value
C1	XHt_Jan	1.486	0.038	39.074	0.00%
C2	XHt_Feb	1.441	0.039	37.362	0.00%
C3	XHt_Mar	1.375	0.039	34.844	0.00%
C4	XHt_Apr	1.302	0.061	21.387	0.00%
C5	XHt_May	1.085	0.104	10.453	0.00%
C6	XHt_Jun	0.650	0.238	2.732	0.85%
C7	XHt_Oct	0.734	0.107	6.887	0.00%
C8	XHt_Nov	1.254	0.066	18.896	0.00%
C9	XHt_Dec	1.377	0.046	29.814	0.00%
C10	Xother	0.160	0.012	12.836	0.00%
C11	Jan01	23.593	6.964	3.388	0.13%
C12	Feb05	-14.292	3.064	-4.665	0.00%
C13	AR(1)	0.533	0.113	4.713	0.00%

Regression Statistics	
Iterations	7
Adjusted Observations	69
Deg. of Freedom for Error	56
R-Squared	0.993
Adjusted R-Squared	0.991
Durbin-Watson Statistic	2.020
AIC	2.470
BIC	2.891
F-Statistic	585.319
Prob (F-Statistic)	0.0000
Log-Likelihood	-167.67
Model Sum of Squares	76067
Sum of Squared Errors	560
Mean Squared Error	10.00
Std. Error of Regression	3.16
Mean Abs. Dev. (MAD)	2.01
Mean Abs. % Err. (MAPE)	5.04%
Ljung-Box Statistic	24.28
Prob (Ljung-Box)	0.4455

Variable	Description
XHt_Jan	January Heating (Heating Equipment Index * Heating Use)
XHt_Feb	February Heating (Heating Equipment Index * Heating Use)
XHt_Mar	March Heating (Heating Equipment Index * Heating Use)
XHt_Apr	April Heating (Heating Equipment Index * Heating Use)
XHt_May	May Heating (Heating Equipment Index * Heating Use)
XHt_Jun	June Heating (Heating Equipment Index * Heating Use)
XHt_Oct	October Heating (Heating Equipment Index * Heating Use)
XHt_Nov	November Heating (Heating Equipment Index * Heating Use)
XHt_Dec	December Heating (Heating Equipment Index * Heating Use)
Xother	Other Usage (Other Equipment Index * Other Use)
Jan01	Binary variable for January 2001
Feb05	Binary variable for February 2005
AR(1)	ARMA(1,0) process applied to errors

Year	Month	Actual	Predicted	Residual	% Residual
2001	1	158.789			
2001	2	106.309	106.309	0.000	0.00%
2001	3	86.416	93.882	-7.466	-8.64%
2001	4	70.489	60.033	10.456	14.83%
2001	5	35.026	35.199	-0.173	-0.49%
2001	6	19.755	21.872	-2.117	-10.71%
2001	7	14.049	14.704	-0.655	-4.66%
2001	8	12.965	13.423	-0.458	-3.53%
2001	9	15.539	14.737	0.803	5.17%
2001	10	24.440	25.451	-1.011	-4.14%
2001	11	47.907	46.125	1.781	3.72%
2001	12	76.604	72.918	3.686	4.81%
2002	1	106.933	104.534	2.399	2.24%
2002	2	97.254	92.315	4.938	5.08%
2002	3	97.465	89.029	8.436	8.66%
2002	4	71.628	73.761	-2.134	-2.98%
2002	5	43.002	43.365	-0.363	-0.84%
2002	6	23.763	22.721	1.042	4.38%
2002	7	14.471	16.770	-2.299	-15.89%
2002	8	14.036	13.910	0.125	0.89%
2002	9	15.129	15.784	-0.654	-4.32%
2002	10	30.856	28.601	2.255	7.31%
2002	11	68.145	62.713	5.432	7.97%
2002	12	91.651	92.142	-0.491	-0.54%
2003	1	111.177	109.718	1.459	1.31%
2003	2	103.830	109.317	-5.486	-5.28%
2003	3	90.514	93.413	-2.899	-3.20%
2003	4	49.081	52.370	-3.289	-6.70%
2003	5	28.066	29.499	-1.433	-5.10%
2003	6	17.100	17.557	-0.457	-2.67%
2003	7	13.853	13.333	0.520	3.75%
2003	8	12.286	13.286	-1.000	-8.14%
2003	9	13.464	14.489	-1.025	-7.62%
2003	10	22.956	23.844	-0.888	-3.87%
2003	11	51.666	52.253	-0.587	-1.14%
2003	12	83.904	85.604	-1.700	-2.03%

Year	Month	Actual	Predicted	Residual	% Residual
2004	1	103.582	105.795	-2.213	-2.14%
2004	2	103.123	105.420	-2.297	-2.23%
2004	3	72.346	69.945	2.402	3.32%
2004	4	48.886	53.479	-4.592	-9.39%
2004	5	31.785	32.403	-0.618	-1.94%
2004	6	18.776	19.640	-0.865	-4.60%
2004	7	14.633	13.211	1.421	9.71%
2004	8	13.621	13.698	-0.076	-0.56%
2004	9	15.096	14.984	0.112	0.74%
2004	10	23.183	23.255	-0.072	-0.31%
2004	11	38.870	45.331	-6.461	-16.62%
2004	12	77.855	75.605	2.250	2.89%
2005	1	114.059	115.520	-1.461	-1.28%
2005	2	74.313	73.038	1.275	1.72%
2005	3	80.239	77.846	2.393	2.98%
2005	4	50.524	50.942	-0.417	-0.83%
2005	5	35.084	33.892	1.193	3.40%
2005	6	23.476	21.043	2.433	10.36%
2005	7	16.744	15.397	1.346	8.04%
2005	8	15.562	16.356	-0.795	-5.11%
2005	9	12.601	15.235	-2.633	-20.90%
2005	10	20.561	21.771	-1.210	-5.89%
2005	11	38.559	41.174	-2.615	-6.78%
2005	12	75.541	77.844	-2.303	-3.05%
2006	1	88.180	86.884	1.296	1.47%
2006	2	83.968	79.655	4.313	5.14%
2006	3	86.246	87.402	-1.157	-1.34%
2006	4	45.901	47.523	-1.622	-3.53%
2006	5	30.208	27.406	2.802	9.28%
2005	6	19.248	18.670	0.579	3.01%
2005	7	15.462	14.939	0.523	3.38%
2005	8	12.503	13.798	-1.295	-10.36%
2005	9	12.765	14.149	-1.383	-10.84%
2006	10	25.156	24.718	0.437	1.74%



Small Interruptible Gas Sales

REGRESSION PERIOD: Jan 2000 – Dec 2005

NUMBER OF OBSERVATIONS: 72

LINEAR LEAST SQUARES MODEL WITH ARMA ERRORS

Small Interruptible Sales = C1*HDD + C2*SmIntCust + C3*March + C4*April + C5* May
 + C6*June + C7*July + C8*August + C9*September + C10*October +
 C11*November + C12*Jun01 + C13*Jul01 + C14*Feb05 + C15*May05 +
 C16*Feb04 + C17*AR(1)

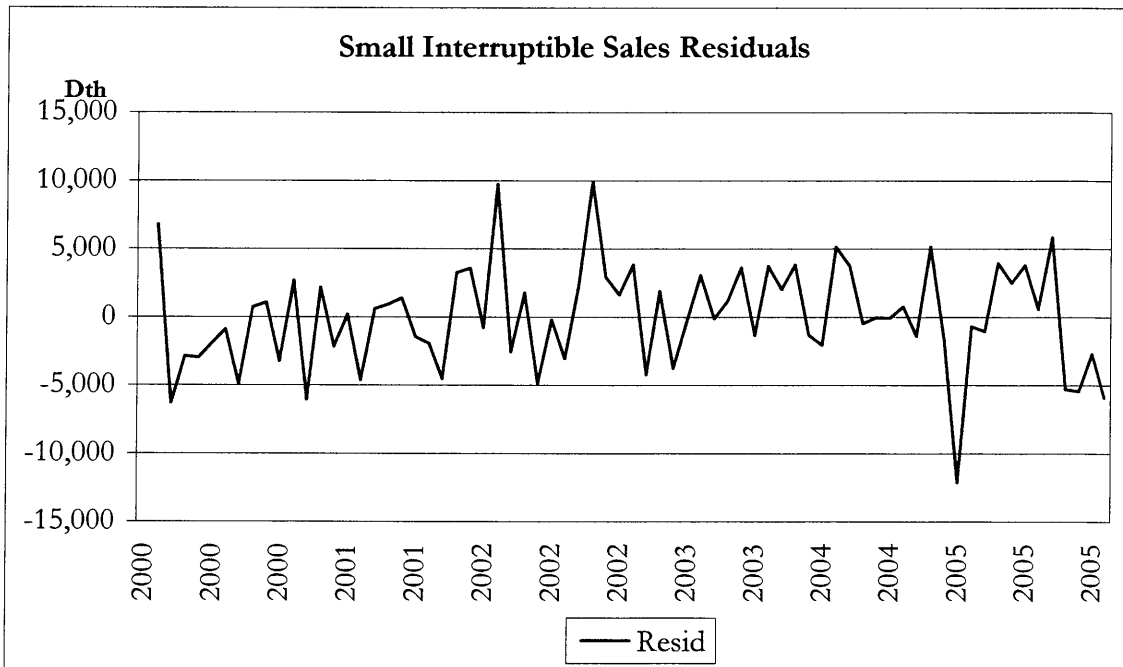
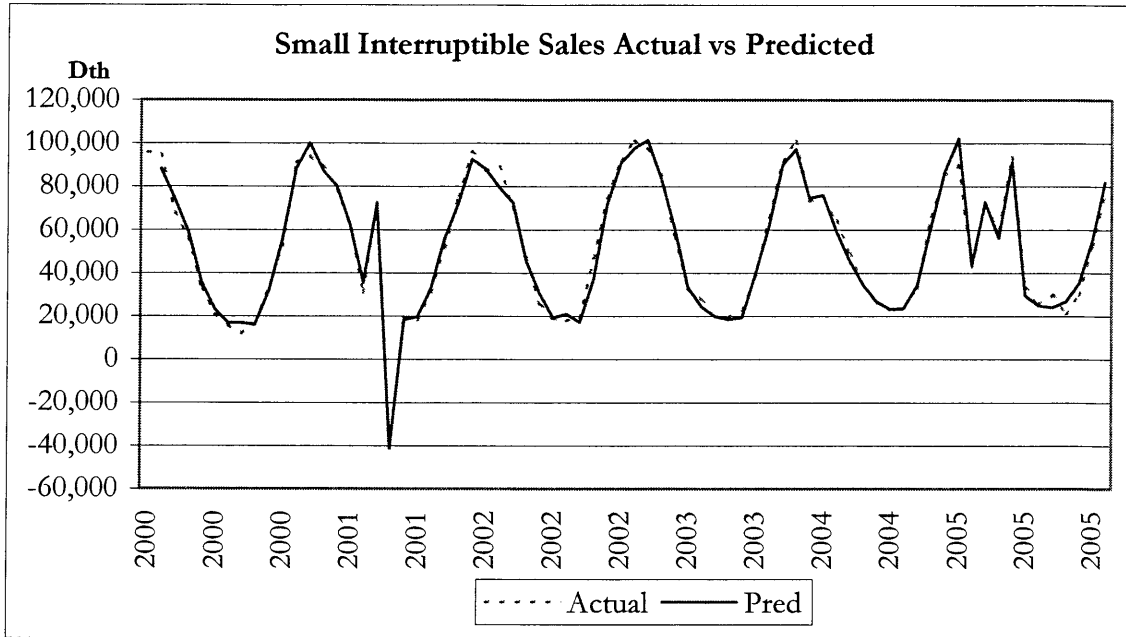
	Variable	Coefficient	StdErr	T-Stat	P-Value
C1	HDD	24.641	3.932	6.267	0.00%
C2	SmIntCust	482.303	55.803	8.643	0.00%
C3	March	-8019.961	2232.093	-3.593	0.07%
C4	April	-11851.724	3453.143	-3.432	0.12%
C5	May	-25556.559	5007.139	-5.104	0.00%
C6	June	-29915.073	5843.060	-5.120	0.00%
C7	July	-32823.902	6307.423	-5.204	0.00%
C8	August	-33502.427	6307.337	-5.312	0.00%
C9	September	-34519.237	5978.325	-5.774	0.00%
C10	October	-26433.790	4738.912	-5.578	0.00%
C11	November	-10880.675	3216.380	-3.383	0.14%
C12	Jun01	48968.860	4570.917	10.713	0.00%
C13	Jul01	-58651.409	4545.815	-12.902	0.00%
C14	Feb05	-38844.495	3930.511	-9.883	0.00%
C15	May05	51156.608	4063.361	12.590	0.00%
C16	Feb04	-26609.693	3957.648	-6.724	0.00%
C17	AR(1)	0.652	0.112	5.844	0.00%

Regression Statistics	
Iterations	6
Adjusted Observations	71
Deg. of Freedom for Error	54
R-Squared	0.984
Adjusted R-Squared	0.979
Durbin-Watson Statistic	1.916
AIC	16.969
BIC	17.511
F-Statistic	193.344
Prob (F-Statistic)	0.0000
Log-Likelihood	-676.48
Model Sum of Squares	62693239410
Sum of Squared Errors	1029994386
Mean Squared Error	19073970.11
Std. Error of Regression	4367.38
Mean Abs. Dev. (MAD)	2978.17
Mean Abs. % Err. (MAPE)	6.84%
Ljung-Box Statistic	19.72
Prob (Ljung-Box)	0.7123

Variable	Description
HDD	Heating Degree Days base 65, Fargo, North Dakota
SmIntCust	Number of Small Volume Interruptible Customers
March	Binary variable for March
April	Binary variable for April
May	Binary variable for May
June	Binary variable for June
July	Binary variable for July
August	Binary variable for August
September	Binary variable for September
October	Binary variable for October
November	Binary variable for November
Jun01	Binary variable for June 2001
Jul01	Binary variable for July 2001
Feb05	Binary variable for February 2005
May05	Binary variable for May 2005
Feb04	Binary variable for February 2004
AR(1)	ARMA(1,0) process applied to errors

Year	Month	Actual	Predicted	Residual	% Residual
2000	1	96,053.000			
2000	2	95,058.000	88,279.271	6,778.729	7.13%
2000	3	67,816.000	74,120.483	-6,304.483	-9.30%
2000	4	56,327.000	59,187.805	-2,860.805	-5.08%
2000	5	32,854.000	35,834.758	-2,980.758	-9.07%
2000	6	21,176.000	23,084.217	-1,908.217	-9.01%
2000	7	16,083.000	16,982.974	-899.974	-5.60%
2000	8	11,927.000	16,851.631	-4,924.631	-41.29%
2000	9	16,853.000	16,144.986	708.014	4.20%
2000	10	32,963.000	31,897.104	1,065.896	3.23%
2000	11	52,452.000	55,701.034	-3,249.034	-6.19%
2000	12	91,216.000	88,524.715	2,691.285	2.95%
2001	1	94,076.000	100,138.560	-6,062.560	-6.44%
2001	2	89,505.300	87,333.539	2,171.761	2.43%
2001	3	78,376.400	80,549.308	-2,172.908	-2.77%
2001	4	62,657.600	62,463.854	193.746	0.31%
2001	5	30,988.600	35,602.877	-4,614.277	-14.89%
2001	6	72,717.000	72,120.747	596.253	0.82%
2001	7	-40,244.000	-41,158.836	914.836	-2.27%
2001	8	19,808.800	18,405.160	1,403.640	7.09%
2001	9	18,277.400	19,716.361	-1,438.961	-7.87%
2001	10	31,116.200	33,054.032	-1,937.832	-6.23%
2001	11	51,746.300	56,281.337	-4,535.037	-8.76%
2001	12	75,475.000	72,237.112	3,237.888	4.29%
2002	1	96,188.800	92,625.803	3,562.997	3.70%
2002	2	87,377.200	88,167.847	-790.647	-0.90%
2002	3	89,247.600	79,522.581	9,725.019	10.90%
2002	4	70,255.200	72,826.282	-2,571.082	-3.66%
2002	5	47,315.800	45,540.734	1,775.066	3.75%
2002	6	25,390.900	30,304.713	-4,913.813	-19.35%
2002	7	19,038.900	19,230.076	-191.176	-1.00%
2002	8	17,975.100	21,030.491	-3,055.391	-17.00%
2002	9	19,440.100	17,237.890	2,202.210	11.33%
2002	10	47,103.500	37,197.028	9,906.472	21.03%
2002	11	74,892.200	71,982.942	2,909.258	3.88%
2002	12	92,345.600	90,709.641	1,635.959	1.77%

Year	Month	Actual	Predicted	Residual	% Residual
2003	1	101,644.300	97,823.393	3,820.907	3.76%
2003	2	97,236.400	101,460.008	-4,223.608	-4.34%
2003	3	86,080.900	84,195.483	1,885.417	2.19%
2003	4	57,229.000	60,995.949	-3,766.949	-6.58%
2003	5	33,099.900	33,419.678	-319.778	-0.97%
2003	6	27,549.800	24,504.144	3,045.656	11.06%
2003	7	19,884.600	20,012.270	-127.670	-0.64%
2003	8	19,644.200	18,471.370	1,172.830	5.97%
2003	9	23,015.500	19,400.196	3,615.304	15.71%
2003	10	38,187.600	39,522.726	-1,335.126	-3.50%
2003	11	65,666.600	61,919.577	3,747.023	5.71%
2003	12	91,990.800	89,953.740	2,037.060	2.21%
2004	1	101,260.900	97,436.960	3,823.940	3.78%
2004	2	73,408.400	74,741.101	-1,332.701	-1.82%
2004	3	74,076.700	76,121.474	-2,044.774	-2.76%
2004	4	64,396.800	59,262.222	5,134.578	7.97%
2004	5	49,261.000	45,503.946	3,757.054	7.63%
2004	6	33,867.200	34,342.862	-475.662	-1.40%
2004	7	26,727.700	26,758.344	-30.644	-0.11%
2004	8	23,183.800	23,255.539	-71.739	-0.31%
2004	9	24,278.200	23,521.744	756.456	3.12%
2004	10	32,852.100	34,240.851	-1,388.751	-4.23%
2004	11	66,378.900	61,210.062	5,168.838	7.79%
2004	12	85,131.600	86,763.380	-1,631.780	-1.92%
2005	1	90,154.400	102,279.850	-12,125.450	-13.45%
2005	2	43,014.300	43,695.216	-680.916	-1.58%
2005	3	71,870.300	72,915.034	-1,044.734	-1.45%
2005	4	60,182.900	56,245.589	3,937.311	6.54%
2005	5	93,820.800	91,335.616	2,485.184	2.65%
2005	6	33,485.500	29,672.464	3,813.036	11.39%
2005	7	25,594.000	25,018.098	575.902	2.25%
2005	8	30,015.000	24,169.518	5,845.482	19.48%
2005	9	21,486.000	26,761.038	-5,275.038	-24.55%
2005	10	29,863.000	35,302.195	-5,439.195	-18.21%
2005	11	52,602.000	55,305.953	-2,703.953	-5.14%
2005	12	76,121.000	82,039.899	-5,918.899	-7.78%



Large Volume Interruptible Gas Sales

REGRESSION PERIOD: Jan 2000 – Dec 2005

NUMBER OF OBSERVATIONS: 72

LINEAR LEAST SQUARES MODEL WITH ARMA ERRORS

Large Volume Interruptible Sales = C1*January+ C2*February + C3*March + C4*April +
 C5*May + C6*June+ C7*July + C8*August + C9*September + C10*October +
 C11*November + C12*December + C13*MA(1)

	Variable	Coefficient	StdErr	T-Stat	P-Value
C1	January	124463.540	9403.857	13.235	0.00%
C2	February	123216.383	9588.611	12.850	0.00%
C3	March	119629.167	9588.611	12.476	0.00%
C4	April	121827.833	9588.611	12.705	0.00%
C5	May	85720.450	9588.611	8.940	0.00%
C6	June	70566.483	9588.611	7.359	0.00%
C7	July	57132.417	9588.611	5.958	0.00%
C8	August	62665.133	9588.611	6.535	0.00%
C9	September	66812.467	9588.611	6.968	0.00%
C10	October	90522.450	9588.611	9.441	0.00%
C11	November	97993.633	9588.611	10.220	0.00%
C12	December	127987.156	9464.982	13.522	0.00%
C13	MA(1)	0.430	0.126	3.423	0.12%

Regression Statistics	
Iterations	5
Adjusted Observations	72
Deg. of Freedom for Error	59
R-Squared	0.652
Adjusted R-Squared	0.581
Durbin-Watson Statistic	1.975
AIC	20.121
BIC	20.532
F-Statistic	8.501
Prob (F-Statistic)	0.0000
Log-Likelihood	-813.52
Model Sum of Squares	51467603331
Sum of Squared Errors	27476504842
Mean Squared Error	465703471.89
Std. Error of Regression	21580.16
Mean Abs. Dev. (MAD)	15525.07
Mean Abs. % Err. (MAPE)	16.13%
Ljung-Box Statistic	20.63
Prob (Ljung-Box)	0.6604

Variable	Description
January	Binary variable for January
February	Binary variable for February
March	Binary variable for March
April	Binary variable for April
May	Binary variable for May
June	Binary variable for June
July	Binary variable for July
August	Binary variable for August
September	Binary variable for September
October	Binary variable for October
November	Binary variable for November
December	Binary variable for December
MA(1)	ARMA(0,1) process applied to errors

Year	Month	Actual	Predicted	Residual	% Residual
2000	1	144,925.000	124,463.540	20,461.460	14.12%
2000	2	166,693.000	132,006.464	34,686.536	20.81%
2000	3	115,262.000	134,530.227	-19,268.227	-16.72%
2000	4	142,240.000	113,550.356	28,689.644	20.17%
2000	5	85,737.000	98,045.293	-12,308.293	-14.36%
2000	6	74,515.000	65,278.939	9,236.061	12.39%
2000	7	70,194.000	61,100.155	9,093.845	12.96%
2000	8	92,618.000	66,571.777	26,046.223	28.12%
2000	9	76,690.000	78,001.717	-1,311.717	-1.71%
2000	10	95,548.000	89,958.947	5,589.053	5.85%
2000	11	133,149.000	100,394.646	32,754.354	24.60%
2000	12	125,296.000	142,058.166	-16,762.166	-13.38%
2001	1	102,257.000	117,262.647	-15,005.647	-14.67%
2001	2	111,660.800	116,770.077	-5,109.277	-4.58%
2001	3	124,449.500	117,434.262	7,015.238	5.64%
2001	4	108,601.100	124,841.524	-16,240.424	-14.95%
2001	5	71,134.600	78,743.693	-7,609.093	-10.70%
2001	6	56,460.500	67,297.677	-10,837.177	-19.19%
2001	7	55,018.600	52,476.851	2,541.749	4.62%
2001	8	56,226.700	63,757.048	-7,530.348	-13.39%
2001	9	80,728.200	63,577.489	17,150.711	21.25%
2001	10	116,969.200	97,890.259	19,078.941	16.31%
2001	11	80,255.400	106,189.795	-25,934.395	-32.31%
2001	12	99,313.000	116,845.946	-17,532.946	-17.65%
2002	1	98,165.400	116,931.526	-18,766.126	-19.12%
2002	2	85,367.000	115,154.605	-29,787.605	-34.89%
2002	3	95,598.100	106,832.648	-11,234.548	-11.75%
2002	4	87,105.100	117,001.561	-29,896.461	-34.32%
2002	5	75,194.400	72,877.168	2,317.232	3.08%
2002	6	79,463.300	71,561.948	7,901.352	9.94%
2002	7	54,867.200	60,526.775	-5,659.575	-10.32%
2002	8	47,395.800	60,233.825	-12,838.025	-27.09%
2002	9	62,277.400	61,297.353	980.047	1.57%
2002	10	90,988.600	90,943.470	45.130	0.05%
2002	11	84,642.400	98,013.021	-13,370.621	-15.80%
2002	12	84,119.800	122,243.244	-38,123.444	-45.32%

Year	Month	Actual	Predicted	Residual	% Residual
2003	1	85,415.300	108,086.012	-22,670.712	-26.54%
2003	2	152,098.100	113,477.226	38,620.874	25.39%
2003	3	166,743.900	136,220.387	30,523.513	18.31%
2003	4	106,954.400	134,940.492	-27,986.092	-26.17%
2003	5	76,786.900	73,697.848	3,089.052	4.02%
2003	6	63,414.700	71,893.516	-8,478.816	-13.37%
2003	7	54,052.900	53,489.985	562.915	1.04%
2003	8	45,234.200	62,906.957	-17,672.757	-39.07%
2003	9	63,089.200	59,220.391	3,868.809	6.13%
2003	10	94,203.400	92,184.460	2,018.940	2.14%
2003	11	110,157.000	98,860.954	11,296.046	10.25%
2003	12	151,798.700	132,839.848	18,958.852	12.49%
2004	1	135,742.100	132,608.113	3,133.987	2.31%
2004	2	121,177.500	124,562.719	-3,385.219	-2.79%
2004	3	140,710.300	118,174.903	22,535.397	16.02%
2004	4	123,344.500	131,508.861	-8,164.361	-6.62%
2004	5	91,739.200	82,213.106	9,526.094	10.38%
2004	6	78,550.500	74,658.818	3,891.682	4.95%
2004	7	62,509.500	58,804.252	3,705.248	5.93%
2004	8	59,508.100	64,256.878	-4,748.778	-7.98%
2004	9	63,973.000	64,772.429	-799.429	-1.25%
2004	10	72,842.500	90,179.022	-17,336.522	-23.80%
2004	11	112,317.000	90,546.002	21,770.998	19.38%
2004	12	149,372.200	137,339.804	12,032.396	8.06%
2005	1	162,479.600	129,632.562	32,847.038	20.22%
2005	2	102,301.900	137,327.210	-35,025.310	-34.24%
2005	3	75,011.200	104,582.572	-29,571.372	-39.42%
2005	4	162,721.900	109,124.207	53,597.693	32.94%
2005	5	113,730.600	108,745.593	4,985.007	4.38%
2005	6	70,994.900	72,708.003	-1,713.103	-2.41%
2005	7	46,152.300	56,396.481	-10,244.181	-22.20%
2005	8	75,008.000	58,264.315	16,743.685	22.32%
2005	9	54,117.000	74,005.421	-19,888.421	-36.75%
2005	10	72,583.000	81,978.543	-9,395.543	-12.94%
2005	11	67,441.000	93,957.383	-26,516.383	-39.32%
2005	12	158,382.000	116,595.929	41,786.071	26.38%

