2014

LONG-TERM FORECAST REPORT

FOR GAS DEMAND, GAS SUPPLY, AND FACILITY PROJECTIONS

Case No. 14-868-GA-FOR

****

OF

DUKE ENERGY OHIO, INC.

139 EAST FOURTH STREET

CINCINNATI, OHIO 45202

A SUBSIDIARY OF DUKE ENERGY CORPORATION

TO THE

PUBLIC UTILITIES COMMISSION OF OHIO

DIVISION OF FORECASTING

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PREFACE

Duke Energy Ohio, Inc. has prepared this Long-Term Forecast Report as a response to Section 4935.04(C) Ohio Revised Code. The organization of the report follows the order of those Rules and Regulations relating to such forecast reports in Ohio Administrative Code 4901:5-7-03.

July 15, 2014

Public Utilities Commission of Ohio
Division of Forecasting
180 East Broad Street
Columbus, OH 43266-0573

RE: 2014 LONG-TERM FORECAST REPORT FOR GAS
DEMAND, GAS SUPPLY, AND FACILITY PROJECTIONS

Pursuant to Ohio Administrative Code Rule 4905:5-3-01, Duke Energy Ohio, Inc. ("Duke Energy Ohio") submits an original and 20 copies of its 2014 Long-Term Forecast Report for Gas Demand, Gas Supply, and Facility Projections.

Portions of this forecast are based upon information and conditions that were current in the spring of 2014. This information is subject to the same degree of review and modification by Duke Energy Ohio as would be exercised by it with respect to its forecasts in general.

Questions regarding the contents of this document should be directed to Mr. Leon T. Brunson (980-373-4242) at Duke Energy's headquarters located at 550 South Tryon, Charlotte, NC, 28202.

Please note that Ms. Elizabeth Watts, Legal Department, is the Attorney of Record for the forecast.

Sincerely,

Leon T. Brunson

Leon T. Brunson
Lead Load Forecasting Analyst
Duke Energy Corporation

Attachments

ATTACHMENT "A"

DUKE ENERGY OHIO, INC.
2014 GAS LONG-TERM FORECAST REPORT

CERTIFICATE OF SERVICE

The undersigned states that he is Lead Load Forecasting Analyst, Duke Energy Shared Services Inc.; that he is duly authorized in such capacity to execute and file this Long-Term Forecast on behalf of Duke Energy Ohio, Inc.; that the facts set forth in this Long-Term Forecast are true and correct to the best of his knowledge, information, and belief, and that all other matters set forth herein reflect the best judgment of Duke Energy Corporation at this time.

I hereby certify that, concurrently with the filing of the 2014 Long-Term Forecast Report for Gas Demand, Gas Supply, and Facility Projections and pursuant to Ohio Administrative Code Rule 4901:5-1-03(E), one copy of the Report has been filed with the Ohio Power Siting Board and one copy has been sent to the public libraries listed on page iv of this Report (Attachment "B").

One copy of this Report will be kept at the principal business address of Duke Energy Ohio, Inc. (139 East Fourth Street, Cincinnati, Ohio) for public inspection during office hours. A copy of the Report will be provided to any person, upon request, at cost to cover expenses incurred.

Leon T. Brunson

Leon T. Brunson
Lead Load Forecasting Analyst
Duke Energy Corporation

15 July 2014
DATE

ATTACHMENT "B"

LIBRARIES RECEIVING A COPY OF DUKE ENERGY OHIO'S 2014 LONG-TERM FORECAST REPORT FOR GAS DEMAND, GAS SUPPLY, AND FACILITY PROJECTIONS

County	Library	Address
Adams	Manchester Branch Library	401 Pike Street Manchester, Ohio 45144
Brown	Mary P. Shelton Library	200 West Grant Avenue Georgetown, Ohio 45121
Butler	Lane Public Library	300 North Third Street Hamilton, Ohio 45011
Butler	Middletown Public Library	125 South Broad Street Middletown, Ohio 45044
Clermont	Clermont County Public Library	180 South Third Street Batavia, Ohio 45103
Clinton	Wilmington Public Library	268 North South Street Wilmington, Ohio 45177
Hamilton	Public Library of Cincinnati and Hamilton County	800 Vine Street Cincinnati, Ohio 45202
Montgomery	Dayton and Montgomery County Public Library	215 East Third Street Dayton, Ohio 45402
Preble	Preble County District Library	450 North Baron Street Eaton, Ohio 45320
Warren	Lebanon Public Library	101 South Broadway Lebanon, Ohio 45036
Highland	Highland County District Library	10 Willettsville Pike Hillsboro, Ohio 45133
Hamilton	University of Cincinnati Library-Reference Division	2600 Clifton Avenue Cincinnati, Ohio 45221

DUKE ENERGY OHIO

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*APPENDIX II and III were filed under seal as critical infrastructure information.

4901:5-7-01 DEFINITIONS

(A) No response necessary.

(B) No response necessary.

(C) No response necessary.

(D) No response necessary.

(E) No response necessary.

(F) No response necessary.

(G) No response necessary.

(H) Duke Energy Ohio" refers to Duke Energy Ohio, Inc. and its service area, not the consolidated system.

(I) No response necessary

4901:5-7-02 PURPOSE AND SCOPE

(A) No response necessary.

(B) No response necessary.

(C) No response necessary.

4901:5-7-03 GAS AND NATURAL GAS DEMAND FORECASTS FOR GAS DISTRIBUTION COMPANIES SERVING MORE THAN FIFTEEN THOUSAND CUSTOMERS

(A) GENERAL GUIDELINES

No response required for items (1) through (4)

(B) SPECIAL SUBJECT AREAS

(1) Description of Forecast Preparation and Coordination

(a) Duke Energy Ohio coordinates its load forecasts with those of Duke Energy Kentucky, Inc., an affiliated company operating in Northern Kentucky. The load forecasts and peak demand forecasts are prepared under common supervision and direction using the same forecasting methodology. In addition, the Duke Energy Ohio gas and electric load forecasts are prepared in the same department and under the same assumptions regarding energy prices and the future course of the local economy.

(b) Duke Energy Ohio also owns two propane peak-shaving plants and has access to a peak shaving plant which is 64% owned by Duke Energy Kentucky. Duke Energy Ohio also has an interconnection with Vectren Inc. (formally the Dayton Power and Light Company) for the sole purpose of transporting gas, on an interruptible basis, to Vectren Inc. from the Texas Gas Transmission. There is no reason to coordinate Duke Energy Ohio's forecasting activities with those of Vectren Inc.

(c) Duke Energy Ohio develops the gas load forecast through the use of econometric computer modeling techniques. Duke Energy relies on Moody's Analytics for all of its national and local economic projections. All series used for the forecast that are available annually or at a greater frequency are updated at least once a year.

(2) State Energy Policy

(a) No response required.

(b) No response required.

(3) Energy Conservation

Changes in gas use due to energy conservation cannot be easily identified within the forecast. Energy conservation tends to occur in response to energy price changes. As such, the effects of energy conservation are included in the energy-price impacts discussed in Section (4) below. However, in the residential sector, the level of energy conservation in the forecast due to increasing furnace efficiency can be estimated. It should be recognized that energy conservation due to increasing furnace efficiency is still a price-driven conservation effect although there is a somewhat longer time lag between cause and effect. The difference between a residential forecast based upon a zero increase in furnace efficiency and the actual forecast is the basis for the gas energy conservation impacts provided in Table 1.

TABLE 1

FURNANCE EFFFICIENCY-INDUCED
CONSERVATION (MCF)

	RESIDENTIAL	SENDOUT	PEAK
2014	59,822	60,612	1,198
2015	159,769	161,879	2,306
2016	300,505	304,474	3,259
2017	476,109	482,397	4,059
2018	681,959	690,966	4,731
2019	912,828	924,884	5,273
2020	1,163,827	1,179,199	5,653

2021	1,429,434	1,448,313	5,930
2022	1,704,910	1,727,428	6,095
2023	1,986,938	2,013,180	6,182
2024	2,272,279	2,302,290	6,144

The estimate of the conservation impact is developed using the same equations and models as the base forecast. For the forecast period (year 0 to 10), the conservation impact is identified by comparing the base forecast to one in which residential furnace efficiency is held constant, i.e., no improvement in efficiency. The difference in gas energy usage and peak demand between the two forecasts represents the projected impact of residential conservation due to the improvement in furnace efficiencies.

(4) Energy Price Relationships

(a) Energy conservation identified within the forecast period reflects changes in gas usage due to changes in the real price of energy. The difference between a forecast based upon a zero percent increase in real energy price and the base forecast provides estimates for the gas conservation impacts seen in Table 2.

TABLE 2
PRICE-INDUCED CONSERVATION
MCF

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	SENDOUT	PEAK
2014	6,979	4,226	27,101	38,812	12
2015	(40,843)	(42,922)	(59,087)	(144,738)	(59)
2016	(44,779)	(46,929)	(78,660)	(172,618)	(67)
2017	(46,890)	(48,011)	(78,791)	(175,986)	(72)
2018	(42,978)	(45,008)	(74,981)	(165,119)	(66)
2019	(37,708)	(37,025)	(70,216)	(146,863)	(57)
2020	(15,410)	(26,728)	(60,071)	(103,559)	(17)
2021	(25,396)	(35,621)	(60,459)	(123,080)	(36)
2022	(34,870)	(44,232)	(60,624)	(141,571)	(55)
2023	(43,783)	(52,355)	(60,657)	(158,865)	(72)
2024	(52,150)	(58,540)	(60,450)	(173,400)	(87)

(b) The impact of energy-price changes is based upon the same equations and models as the base forecast. For the forecast period (year 0 to 10), energy-price impacts were identified by comparing the base forecast to one with a zero percent annual increase in the real average price of natural gas. The resulting difference in energy usage and peak demand represents the forecasted impact of conservation due to increases in the real price of energy.

(C) FORECAST DOCUMENTATION

(1) Forecast Methodology

(a) The general framework of the Gas Energy and Peak Load Forecast of Duke Energy Ohio and Subsidiary Companies involves a national economic forecast, a service area economic forecast, and the gas load forecast.

The national economic forecast provides information on the prospective growth of the national economy. This involves projections for future levels of numerous national economic and demographic concepts such as population, employment, gross product, inflation, and income. The national economic forecast is obtained from Moody's Analytics, a national economic consulting firm.

In conjunction with the forecast of the national economy, Duke Energy Ohio also procures a service area economic forecast from Moody's Analytics. This forecast is used as drivers within the energy and peak models to produce the gas load forecast.

The following sections discuss the service area economic forecast and the methodological framework of the gas energy model and peak load model.

Service Area Economic Forecast. The service area economic forecast and the national economic forecast are prepared by Moody's Analytics. The service area forecast incorporates both national and local impacts into the local economic forecast.

There are four major sectors to the service area forecast: employment, income, production, and population. Total income for the local economy is forecasted by preparing projections of wages, rents, proprietors' incomes, personal contributions for social insurance, and transfer payments. These projections are then summed to produce the income forecast. Inflation is measured by changes in the Personal Consumption Expenditure Index (PCE) for gasoline and other energy goods.

Moody's Analytics provides local forecasts for income, population, and gross product. These forecasts serve as inputs into the energy and peak load forecast models.

Employment. Total service area employment can be broken into three major categories: commercial, industrial, and governmental sectors.

Income: Income is broken into five components, which together produce total nominal service area income. The five components are wage and salary disbursements, governmental transfer payments, property income, proprietors'' income, and personal contributions for social insurance. These components are summed to compute personal income as follows:

$$
\begin{aligned}
&Local\ Personal\ Income \\
&= Local\ Wage\ and\ Salary\ Disbursements\ (including\ other\ Income) \\
&+ Service\ Area\ Governmental\ Transfer\ Payments \\
&+ Local\ Property\ Income + Local\ Proprietors'Income \\
&- Local\ Personal\ Contributions\ for\ Social\ Insurance
\end{aligned}
$$

Population: Service area population projections are provided for each five-year age-cohort by Moody's Analytics.

Gas Energy Forecast

Duke Energy Ohio supplies and distributes gas in the Southern Ohio counties within the Greater Cincinnati metropolitan area, while Duke Energy Kentucky supplies and distributes natural gas in Northern Kentucky counties within the Greater Cincinnati metropolitan area. Duke Ohio and Duke Kentucky forecasts models employ econometric equations that estimate gas load using local and regional data from each territory. The sum of these forecasts is equivalent to the consolidated system.

The Residential Sector. The forecast of residential gas usage is broken into two major parts: A forecast of the number of residential customers, and a forecast of gas usage (MCF) per residential customer. The forecast of total residential sales is the product of the residential customer forecast and the use per customer forecast, or:

$$Residential\ Sales =$$
$$\#\ Residential\ Customers\ x\ Use\ per\ Residential\ Customer$$

Residential Customers. The forecast of residential natural gas customers is generated using the electric residential customer forecast. The electric residential customer forecast is driven by the number of projected households in the Duke Energy Ohio territory. The residential gas forecast assumes that all Duke Energy Ohio residential customers consume electricity, but not all residential customers will have natural gas service. Therefore

$$ResidentialCustFcst_{Gas} = b * ResidentialCustFcst_{Electric}$$

Where b ≈ saturation rate of gas customers in the Duke Energy Ohio territory.

The statistical results from the residential customer model reveal that coefficient b is equal to 62.8, which implies that 62.8% of all electric customers in the Duke Ohio territory use natural gas for heating. This statistic is in line with Duke Energy Ohio's Residential Saturation Survey results for 2013, whose results concluded that the natural gas saturation rate was 59.3% for all residential customers, and 62.8% for residential customers who were home owners.

Residential Use per Customer. The general structure of the relationship is as follows:

$$ResidentialGas_{UPC} = f(Real\ Average\ Gas\ Price, HDD, Real\ Household\ Median\ Income)$$

In general, residential natural gas consumption is dependent upon usage for space heating, water heating, cooking, and to a lesser extent, clothes drying. If a customer has obtained gas service, the usage of gas tends to exhibit a regular pattern that follows weather conditions, though it has experienced some downward pressure due to conservation, driven by increasing equipment efficiencies. This phenomenon is evidenced by the historical downward trend in gas usage per customer.

In the gas use per customer model above ($ResidentialGas_{UPC}$), the estimated coefficient for real average gas price represents an estimate of the price elasticity. One issue regarding this estimate is the degree of price-reversibility inherent in the way consumers use natural gas. In other words, perfect price-reversibility assumes that consumers react the same to a price increases as to a price decrease, while imperfect price reversibility implies that consumer responses to a price change can vary depending upon whether the price increased or decreased.

An article in an issue of the Energy Journal (Dermot Gately, "Imperfect Price-Reversibility of U.S. Gasoline Demand: Asymmetric Responses to Price Increases and Declines," Energy Journal, Volume 13 (4), 1992 pp. 179-207), examined this issue, and proposed one model for estimating price elasticity for price increases and another for price declines. The reasoning behind the differences in price elasticity follows from the realization that once a more efficient piece of equipment has been installed, price declines do not evoke the same type of increase in energy use as price increases.

Applying the same logic to residential natural gas sales, once insulation levels have been raised or a more efficient furnace has been installed, price declines do not bring the same degree of response as price increases. Presumably, as prices rose in the past, consumers adjusted their thermostats in the short-run, but eventually in the longer-term, consumers adjusted the energy efficiency of their thermal shell, furnaces, or other pieces of their energy—using capital stock. Once the investments have been made, they are not likely to be removed. As a result, one should expect that the percentage impact on sales and usage from a specific percent decline in price be less than that form a similar percent increase in price. Likewise, if a price increase causes the price to exceed its highest level historically, the consumer response is expected to vary from other price increases, as well as price declines.

Commercial Sector. There are two components to the total commercial sector gas forecast: Commercial firm, and Commercial interruptible sales. The distinction between firm and interruptible usage is required due to the differences in supply conditions and gas prices. The forecast is prepared for firm commercial deliveries and interruptible commercial deliveries (which both include transportation gas). Total commercial gas usage is computed as the sum of firm and interruptible deliveries.

Commercial Gas Deliveries—Firm. An econometric equation structure can be used to forecast Duke Energy Ohio firm commercial deliveries. Commercial firm gas deliveries are found to be dependent upon household projections, the real average price of gas, and normal heating degree weather. The general form of the equation is as follows:

$$CommercialGasDeliveries_{Firm} = f(Households, Real\ Average\ Gas\ Price, \quad HDD)$$

Commercial Gas Deliveries—Interruptible. Duke Energy Ohio Interruptible commercial gas sales are forecast using a relationship similar to firm commercial gas deliveries.

Industrial Gas Deliveries—Firm. An econometric equation structure can be used to forecast Duke Energy Ohio firm industrial deliveries. Industrial firm gas deliveries are found to be dependent upon real manufacturing gross product, the real average price of gas, and normal heating degree weather. The general form of the equation is as follows:

$$IndustrialGasDeliveries_{Firm} = f(RealManufacturing\ GDP, Real\ Average\ Gas\ Prices, HDD)$$

Industrial Gas Deliveries—Interruptible. Duke Energy Ohio Interruptible industrial gas deliveries are forecast using a relationship similar to firm industrial gas deliveries.

Gas transported through our system for industrial customers are included in the amount of interruptible deliveries. Preparing the forecast in this manner provides an indication of the total gas usage and hence the available market for gas.

Other Public Authority Gas Deliveries (OPA). The forecast model for the OPA sector is similar in structure to the commercial sector model. The two components that make up the OPA forecast include OPA firm and OPA interruptible gas deliveries

OPA Gas Deliveries—Firm. An econometric equation structure can be used to forecast Duke Energy Ohio firm OPA deliveries. OPA firm gas deliveries are found to be dependent upon projected OPA customers, the real average price of gas, and normal heating degree weather. The general form of the equation is as follows:

$$OPAFirmGasDeliveries = f(Governmental\ Employment, Real\ Average\ Gas\ Prices, HDD)$$

OPA Gas Deliveries—Interruptible. Duke Energy Ohio Interruptible OPA gas deliveries are forecast using a relationship similar to firm OPA gas deliveries.

Street Lighting. Gas deliveries to Duke Energy Ohio Street Lighting customers are directly related to the projected number of Street Lighting gas customers, which are driving by the projected number of households.

Inter-Departmental (ID) Gas Sales. The Duke Energy Ohio ID sales forecast is generated using a seasonal trend projection.

Company Use (CU) Gas Sales. The Duke Energy Ohio CU sales forecast is generated using a seasonal trend projection.

Total System Deliveries. Once the forecasts for all sectors are completed, the forecast for total system deliveries can be prepared. This requires that all individual sector forecasts be combined along with the Inter-Departmental sales forecast:

$$Total\ System\ Deliveries = sum(TotalRESGas, TotalCOMGas, TotalINDGas, TotalOPAGas, TotalSLGas, TotalIDGas)$$

A projection for pipeline losses is then computed, using the annual historical average of pipeline losses for the past three years:

$$Projected\ Gas\ Line\ Losses = Average(Annual\ Gas\ Losses_{-1}, Annual\ Gas\ Losses_{-2}, Annual\ Gas\ Los$$

Total System Sendout. Once the projection for losses are computed, a forecast for Gas Sendout can be generated, which is a function of Total System Deliveries, Company Use, and Gas Line Losses:

$$Gas\ Sendout = sum(Total\ System\ Deliveries, CU, Gas\ Line\ Losses)$$

Once the gas sendout forecast is completed, the gas peak load forecast can be generated.

The Peak Load Forecast

The winter peak demand forecast is generated using econometric modeling. The econometric model was obtained by examining the historical relationship between monthly peak and factors such as weather, the economy, and space heating saturation. Therefore, the winter peak forecast is driven by the energy model's forecast of total system deliveries and weather. The peak forecast is produced under specific assumptions regarding the weather conditions that normally occur at the time of the peak.

Peak Load Specification. The winter peak equation has the following specification:

$$Peak = f(Weather\ Normalized\ Deliveries, Weather)$$

The variables used to represent weather at the winter peak are the heating degree days and average wind speed on the day of the peak. The model indicates that the heating degree days on the day before the peak are also important.

Weather-Normalized Deliveries. The level of peak demand is related to economic conditions such as manufacturing GDP and prices. The best indicator of the combined influences of economic variables on peak demand is the level of base load demand exclusive of aberrations cause by abnormal weather. Thus, the first step in developing the above described peak equation is to weather normalize monthly deliveries. Historical weather normalized deliveries is found by summing the component pieces of sendout after these have been weather normalized. That is, the historical values of residential, commercial and other sales are adjusted to what they would have been if normal weather had occurred. This adjustment is performed using the results from the equations described in earlier sections. In all cases, the equations used to explain historical sales and to forecast sales into the future can be separated into a weather component and a component dependent upon economic variables as follows:

$MCF = f(W)g(E)$MCF = f(W)g(E)

Where: MCF = Sales

W = Weather Variables

E = Economic and other variables.

In the case of historical sales figures, actual sales resulted from actual weather conditions so the equation can be rewritten as:

$$MCF_a = f(W_a)g(E)$$

With the "a" subscript referring to actual weather conditions.

Similarly, under "normal" conditions the equation would be:

$$MCF_n = f(W_n)g(E)$$

With the "n" subscript referring to "normal" weather conditions.

Dividing equation (8b) by equation (8a) yields:

$$MCF_n = MCF_a \frac{fW_n}{fW_a}$$

Thus, weather normal sales are found by scaling actual sales using a factor based on the forecast model equations.

This weather-adjusted sendout was then used as the driving variable in the winter peak equation.

Forecast Procedure

The seasonal winter peak is assumed to occur in January of the winter season (November through March) of the year for which it is reported. Since the energy model produces forecasts under the assumption that normal weather will prevail, the forecast of sendout is "weather normalized" by design. Thus, the forecast of deliveries drives the forecast of the peaks. In the forecast, the equation weather variables are set to values determined to be normal peak-producing conditions. These values were derived using historical weather data.

Gas Price

A key ingredient throughout the development of econometric models for use in projecting gas consumption is the selection of the gas price variable. Due to the historical use of declining block rates, a degree of simultaneity exists between the bill charged a customer and the customer's energy usage. If, for example, a customer or group of customers would increase their usage due to extreme weather conditions (or other circumstances), the average price of gas, $/MCF, would fall as those customers' usage moved into higher MCF consumption blocks with lower marginal energy rates. In an econometric model, this could be incorrectly interpreted to mean that the price decrease brought about an increase in gas consumption instead of the correct cause—the extreme weather.

The price variable issue has received significant attention in the economic literature, most noticeably after the publication of two articles in 1975, one by Robert Halvorsen and the other by Lester Taylor. Numerous solutions have been offered and, in turn, criticized since that time. Most of the attention, however, has been focused on electricity demand, but the same situation exists for any price schedule containing declining or increasing block rates, including gas and water rates. Some of the suggested solutions offered in the literature are as follows:

--Average price is appropriate since that is the price customers observe

--Marginal price should be employed because that is the price to which customers actually respond.

--An estimated average price is appropriate where the estimated price is developed from a first stage equation that incorporates the factors affecting the level of gas price (i.e., labor, capital, and fuel costs).

--Marginal price should be employed with an income premium variable to account for the income effects associated with declining block rates.

The existence of simultaneity between energy consumption and average price is potentially quite serious. If average price were employed in an econometric model using time series data, conservation by customers over time could raise the average price and result in an incorrect estimation of the price elasticity.

To avoid this problem in the Duke Energy Ohio forecast, a fixed level of consumption is used to select the price from the relevant rate schedule at each point in time. This is not a restrictive procedure because the range of consumption within a block is rather wide for the relevant blocks.

This approach was employed for the development of historical price data for the customer classes.

This technique avoids the serious problem of simultaneity between usage and price and allows the true price changes which customers have experienced to be reflected in the data and the econometric models.

(b) Specific Analytical Techniques Used

Regression Analysis

Ordinary least squares is the principal regression technique employed to estimate the relationships among the relevant variables. However, quite often there is a lagged response between the change in one variable and a subsequent change in another variable. For example, if the real price of gas changes, consumers usually do not fully adjust to the price change in the same time period. Rather, it takes several months or more for the consumer to alter the stock of energy using equipment in the home and to complete the adjustment process. To incorporate this concept of lagged response, the energy model equations employ a polynomial distributed lag structure.

Polynomial Distributed Lag Structure

One method of accounting for the lag between a change in one variable and its ultimate impact on another variable is through the use of polynomial distributed lags. This technique is also referred to as Almon lags. Polynomial distributed lag structures derive their name from the fact that the lag weights follow a polynomial of specified degree. That is, the lag weights all lie on a line, parabola, or higher order polynomial as required. This technique is employed in developing econometric models for most of the energy equations.

Serial Correlation

It is often the case in forecasting an economic time series that forecast errors in one period are related to those in a previous period. By correcting for serial correlation of the estimated residuals, forecast error is reduced. The Marquardt algorithm (similar to the Gauss-Newton method) is employed to correct for the existence of autocorrelation. This correction technique was used in numerous instances in the development of the econometric equations.

<u>Qualitative Variables</u>

In several equations, qualitative variables are employed. In estimating an econometric relationship using time series data, it is quite often the case that outliers will occur. The unusual deviations in the data can be the result of data problems such as errors in the reporting of data or other such perturbations that do not repeat with predictability. Therefore, in order to identify the underlying economic relationship between the dependent and independent variables, qualitative variables are employed to remove the outliers.

(c) The relationship between specific techniques are discussed in (b)

(d) Summary of Statistical Techniques Used

i. <u>Equations</u>

A display of all the relevant equations used in the forecast can be viewed starting on page 1-20. Specifically, for each of the equations in the Gas Energy Forecast Model and Gas Peak Load Model the following information is included:

ii. <u>Statistical Test Results</u>

The results of the estimation of each of the stochastic equations in the models is provided. Included are the estimated coefficients and the results of appropriate statistical tests. Those equations which required a correction for serial correlation are so indicated.

The computer output for each variable lists the estimated coefficient , standard error, and the t-statistic. In the forecast equations, lagged variables and the number of periods lagged are denoted in the definition column.

iii. A description of the statistical technique

A comprehensive overview of statistical techniques are provided in (C)(1)(b) above

iv. Rationale for using the chosen techniques

A comprehensive overview rationalizing the validity of the techniques used are provided in (C)(1)(b) above

v. Computer Software

All of the equations in the Gas Energy Forecast Model and Gas Peak Load Model were estimated and forecasted on personal computers using the MetrixND software from Itron, Inc.

(e) Interruptible Load Forecast

Duke Ohio energy has interruptible gas volumes in the commercial, industrial, and governmental classes. All three sectors use the same forecast methodology as the traditional gas volume forecast models.

(f) Use Per Customer

An overview of the use per customer projection is provided in section C(1)(a).

(g) Methodology Changes

No significant forecast methodology change has been made for any customer class to develop the2014 OH IRP gas forecast, compared to the previous IRP. One subtle difference is the switch in analytical software from Eviews to Itron.

(2) Assumptions and Special Information.

(a) The 2014 gas forecast employs the following assumption:

The Duke Ohio gas residential customer forecast is dependent upon the Duke Ohio electric customer forecast. It is assumed that all Duke Ohio residential gas customers have electric service, but not all Duke Ohio residential electric customers have gas service. Given this, the forecast model will produces statistical results, one of which is the residential gas saturation rate for the territory, denoted by the coefficient for the residential electric customer forecast. Utilizing the electric customer forecast also helps improve forecast accuracy due to the positive relationship and high correlation between the two.

(b) No special information was used in this forecast

(3) Data base documentation

(a) Data sets used to develop the Duke Energy Ohio gas forecast:

i. Historical customers, sales, and price data. Source: Duke Energy Ohio

ii. Regional, state, and U.S. economic projections: Moody's Analytics

Moody's Analytics is widely recognized as a reliable provider of economic projections worldwide. Duke Energy Ohio has used Moody's Analytics for years as their economic vendor. Each year, this relationship is evaluated to determine its value in relation to its cost and effectiveness.

(b) No action necessary.

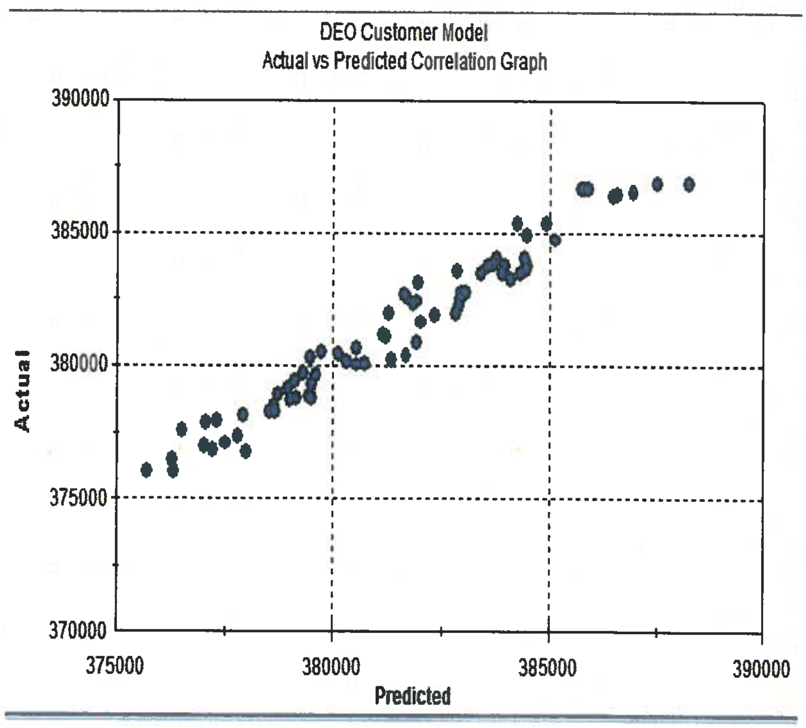
(c) No action necessary.

GAS EQUATIONS AND STATISTICAL TEST RESULTS

DEO RESIDENTIAL CUSTOMER MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mFORGASMODELS.RES_eCUST_forGAS	0.628	0.001	874.548	0.00%		ELECTRIC CUSTOMER FORECAST (w HOUSEHOLDS AS ECONOMIC DRIVER)
mBin.JUN_2009	1257.706	371.757	3.383	0.13%		JUNE 2009
mBin.NOV_2009	-1520.970	369.351	-4.118	0.01%		NOVEMBER 2009
mBin.FEB_2010	-2634.102	364.678	-7.223	0.00%		FEBRUARY 2010
mBin.MAY_2010	-969.971	363.181	-2.671	1.00%		MAY 2010
mBin.JUL_2010	-832.551	371.892	-2.239	2.93%		JULY 2010
mBin.DEC_2010	720.976	360.394	2.001	5.05%		DECEMBER 2010
mBin.FEB_2011	-2530.497	358.621	-7.056	0.00%		FEBRUARY 2011
mBin.MAR_2013	-983.944	368.748	-2.668	1.00%		MARCH 2013
mBin.MAY_2013	-1053.179	366.158	-2.876	0.57%		MAY 2013
mBin.Jan	455.111	141.783	3.210	0.22%		JANUARY
mBin.Mar	545.418	163.330	3.339	0.15%		MARCH
mBin.Apr	576.341	162.104	3.555	0.08%		APRIL
mBin.Jun	-778.796	195.232	-3.989	0.02%		JUNE
mBin.Jul	-1337.755	213.527	-6.265	0.00%		JULY
mBin.Aug	-2484.594	218.177	-11.388	0.00%		AUGUST
mBin.Sep	-2286.899	216.799	-10.548	0.00%		SEPTEMBER
mBin.Oct	-2168.053	201.400	-10.765	0.00%		OCTOBER
mBin.Nov	-409.900	185.760	-2.207	3.16%		NOVEMBER
AR(1)	0.802	0.089	9.026	0.00%		
AR(2)	0.198	0.090	2.210	3.13%		

Model Statistics	
Iterations	24
Adjusted Observations	75
Deg. of Freedom for Error	54
R-Squared	0.958
Adjusted R-Squared	0.943
AIC	13.405
BIC	14.054
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-588.12
Model Sum of Squares	650,538,805.00
Sum of Squared Errors	28,428,010.92
Mean Squared Error	526,444.65
Std. Error of Regression	725.57
Mean Abs. Dev. (MAD)	515.47
Mean Abs. % Err. (MAPE)	0.14%
Durbin-Watson Statistic	1.973
Durbin-H Statistic	#NA
Ljung-Box Statistic	21.65
Prob (Ljung-Box)	0.6001
Skewness	0.039
Kurtosis	2.357
Jarque-Bera	1.310
Prob (Jarque-Bera)	0.5195

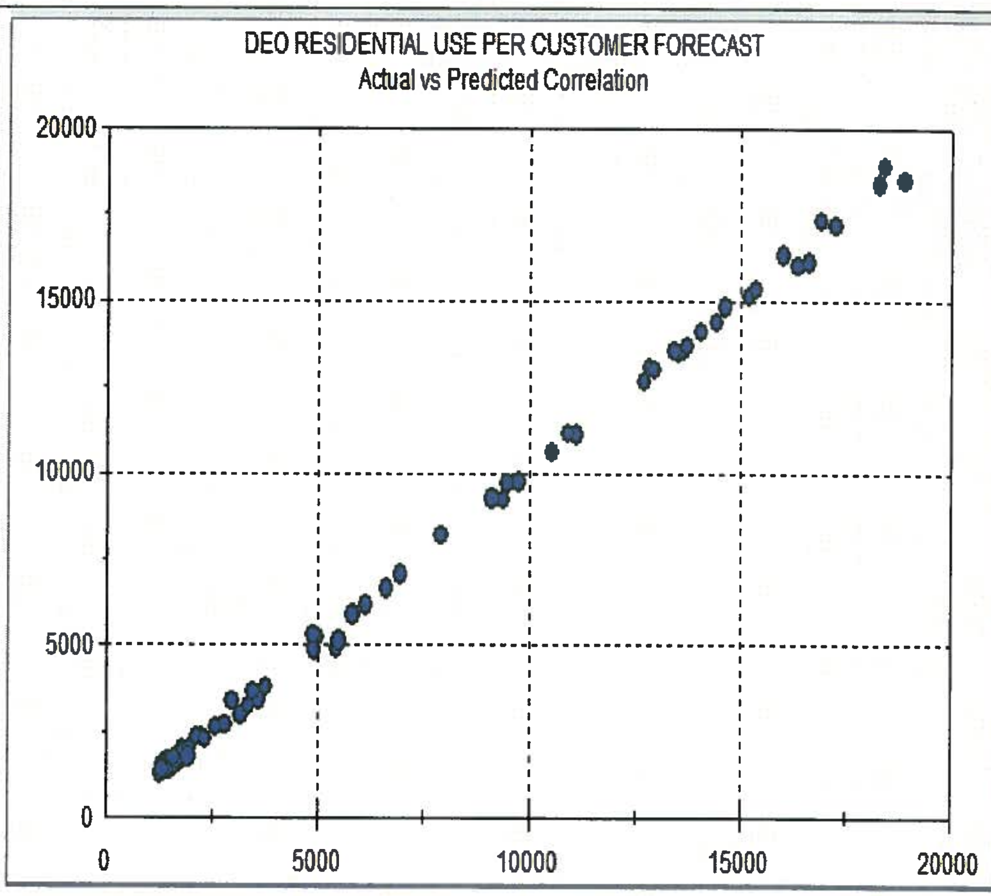


DUKE ENERGY OHIO
4901:5-7-03

DEO RESIDENTIAL USE PER CUSTOMER MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mDegreeDays_B.HDD_B_59	15.157	0.346	43.809	0.00%		BILLED HEATING DEGREE DAY, BASE 59
CGE_LagPrice.PriceLag_RES	-65.513	27.146	-2.413	1.89%		REAL AVERAGE RESIDENTIAL PRICE, LAGGED 12 MONTHS
Econ.INC_REAL_HOUSEHOLD_MEDIAN	0.057	0.007	8.284	0.00%		OH REAL MEDIAN HOUSEHOLD INCOME
mBin.MAY_2010	-359.274	235.002	-1.529	13.17%		MAY 2010
mBin.APR_2012	-796.728	240.821	-3.308	0.16%		APRIL 2012
mCalendar.Jan	786.825	151.655	5.188	0.00%		JANUARY
mCalendar.Feb	1126.115	144.621	7.787	0.00%		FEBRUARY
mCalendar.Mar	980.020	120.480	8.134	0.00%		MARCH
mCalendar.Apr	336.331	178.345	1.886	6.42%		APRIL
mCalendar.May	-418.551	246.486	-1.698	9.48%		MAY
mCalendar.Jun	-661.657	282.382	-2.343	2.25%		JUNE
mCalendar.Jul	-975.817	293.268	-3.327	0.15%		JULY
mCalendar.Aug	-1112.299	293.349	-3.792	0.04%		AUGUST
mCalendar.Sep	-1018.859	288.450	-3.532	0.08%		SEPTEMBER
mCalendar.Oct	-1183.565	256.671	-4.611	0.00%		OCTOBER
mCalendar.Nov	-1044.340	180.469	-5.787	0.00%		NOVEMBER

Model Statistics	
Iterations	1
Adjusted Observations	75
Deg. of Freedom for Error	59
R-Squared	0.999
Adjusted R-Squared	0.999
AIC	10.923
BIC	11.418
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-500.04
Model Sum of Squares	2,554,713,568.99
Sum of Squared Errors	2,714,092.04
Mean Squared Error	46,001.56
Std. Error of Regression	214.48
Mean Abs. Dev. (MAD)	136.18
Mean Abs. % Err. (MAPE)	3.36%
Durbin-Watson Statistic	1.992
Durbin-H Statistic	#NA
Ljung-Box Statistic	24.10
Prob (Ljung-Box)	0.4558
Skewness	-0.488
Kurtosis	4.224
Jarque-Bera	7.658
Prob (Jarque-Bera)	0.0217

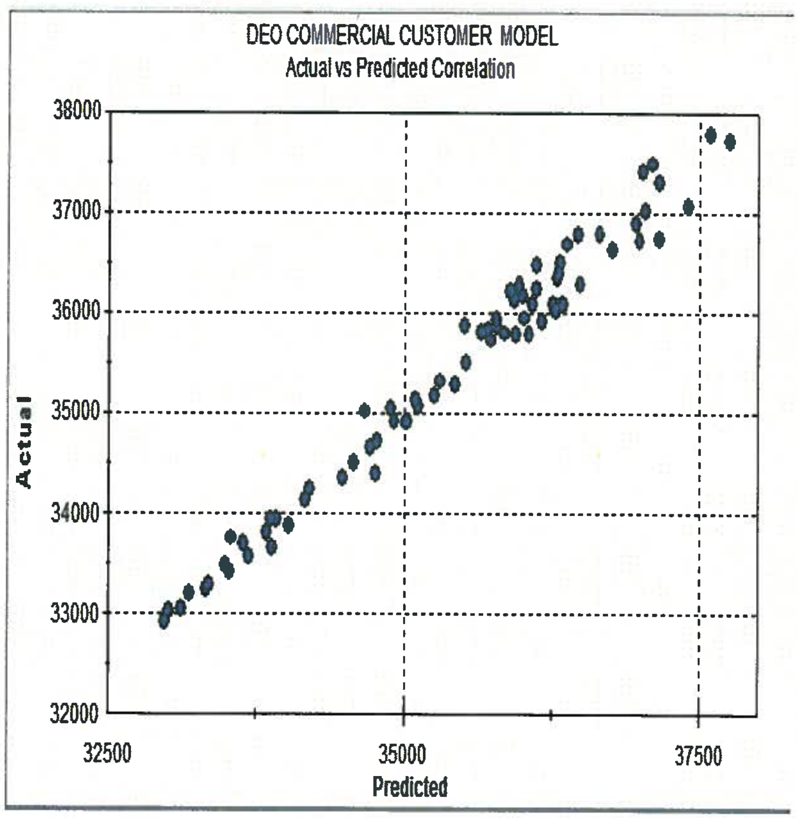


DUKE ENERGY OHIO
4901:5-7-03

DEO COMMERCIAL FIRM CUSTOMER MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mFORGASMODELS.COM_eCUST_forGAS	0.520	0.029	18.226	0.00%		ELECTRICAL COMMERCIAL CUSTOMER FORECAST, DRIVEN BY PROJECTED HOUSEHOLDS
mBin.FEB_2009	447.115	143.654	3.112	0.28%		FEBRUARY 2009
mBin.NOV_2013	315.038	157.452	2.001	4.98%		NOVEMBER 2013
mBin.Apr	-531.069	78.450	-6.769	0.00%		APRIL
mBin.May	-1267.264	104.329	-12.147	0.00%		MAY
mBin.Jun	-1656.711	118.298	-14.005	0.00%		JUNE
mBin.Jul	-2021.397	124.996	-16.172	0.00%		JULY
mBin.Aug	-2263.383	124.662	-18.156	0.00%		AUGUST
mBin.Sep	-2313.087	118.291	-19.554	0.00%		SEPTEMBER
mBin.Oct	-1993.879	103.735	-19.221	0.00%		OCTOBER
mBin.Nov	-846.262	82.722	-10.230	0.00%		NOVEMBER
AR(1)	0.979	0.026	37.970	0.00%		

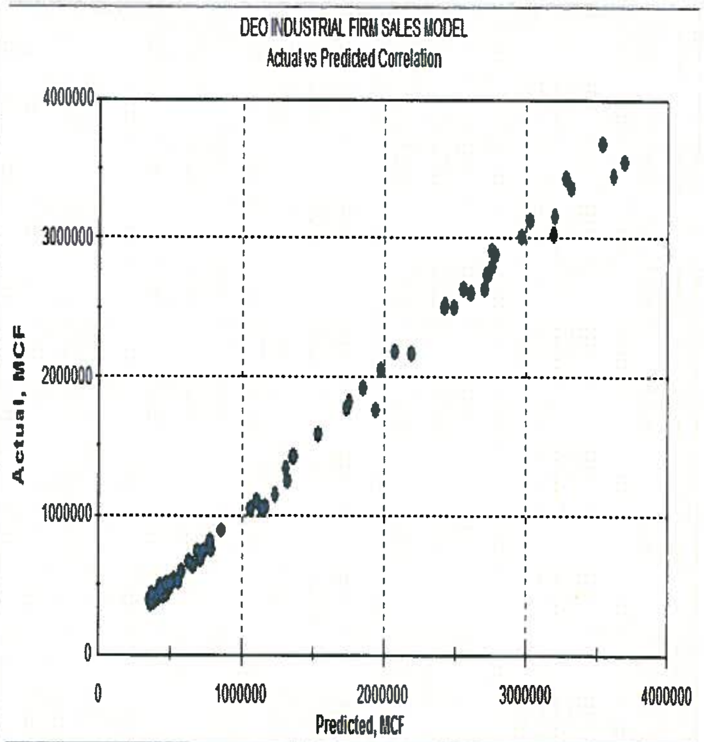
Model Statistics	
Iterations	27
Adjusted Observations	74
Deg. of Freedom for Error	62
R-Squared	0.979
Adjusted R-Squared	0.975
AIC	10.770
BIC	11.143
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-491.48
Model Sum of Squares	119,319,731.61
Sum of Squared Errors	2,544,640.51
Mean Squared Error	41,042.59
Std. Error of Regression	202.59
Mean Abs. Dev. (MAD)	146.53
Mean Abs. % Err. (MAPE)	0.41%
Durbin-Watson Statistic	1.317
Durbin-H Statistic	#NA
Ljung-Box Statistic	54.50
Prob (Ljung-Box)	0.0004
Skewness	0.153
Kurtosis	2.613
Jarque-Bera	0.749
Prob (Jarque-Bera)	0.6877



DEO COMMERCIAL FIRM SALES FORECAST

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mDegreeDays_B.HDD_B_59	2815.735	184.090	15.295	0.00%		BILLED HEATING DEGREE DAY, BASE 59
mDegreeDays_B.HDD_B_50	388.228	254.718	1.524	13.22%		BILLED HEATING DEGREE DAY, BASE 50
mReport.FCUST_COM	13.487	0.567	23.791	0.00%		DUKE OHIO COMMERCIAL GAS CUSTOMER FORECAST
CGE_LagPrice.PriceLag_COM	-10239.655	4545.652	-2.253	2.76%		PROJECTED REAL COMMERCIAL PRICE, LAGGED 10 MONTHS
mBin.OCT_2009	-78088.809	67827.676	-1.151	25.37%		OCTOBER 2009
mCalendar.Aug	-47614.478	29130.873	-1.635	10.68%		AUGUST
AR(1)	0.245	0.125	1.961	5.41%		

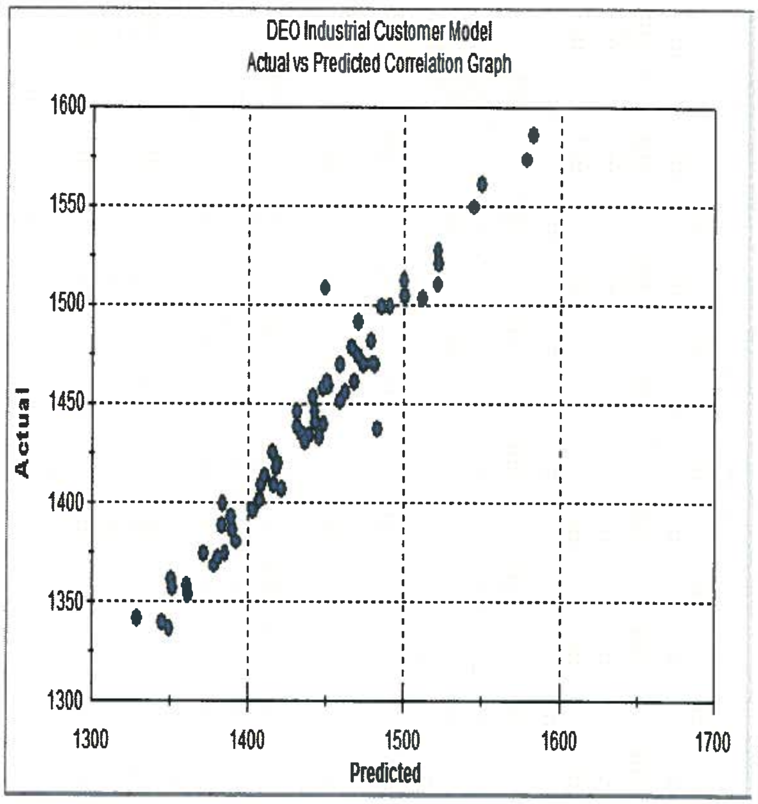
Model Statistics	
Iterations	10
Adjusted Observations	74
Deg. of Freedom for Error	67
R-Squared	0.996
Adjusted R-Squared	0.996
AIC	22.397
BIC	22.615
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-926.68
Model Sum of Squares	83,066,207,967,014.80
Sum of Squared Errors	326,458,550,499.83
Mean Squared Error	4,872,515,679.10
Std. Error of Regression	69,803.41
Mean Abs. Dev. (MAD)	48,920.94
Mean Abs. % Err. (MAPE)	4.22%
Durbin-Watson Statistic	2.053
Durbin-H Statistic	#NA
Ljung-Box Statistic	18.90
Prob (Ljung-Box)	0.7575
Skewness	-0.535
Kurtosis	4.093
Jarque-Bera	7.216
Prob (Jarque-Bera)	0.0271



DEO INDUSTRIAL FIRM CUSTOMER FORECAST MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
ELECTRIC_mindModelOutput.Filled	0.665	0.003	264.377	0.00%		ELECTRIC INDUSTRIAL CUSTOMER FORECAST. DRIVEN BY MANUFACTURING EMPLOYMENT
mBin.FEB_2009	39.712	12.443	3.192	0.25%		FEBRUARY 2009
mBin.MAY_2009	22.759	13.965	1.630	10.96%		MAY 2009
mBin.JAN_2010	78.971	12.438	6.349	0.00%		JANUARY 2010
mBin.APR_2010	-22.875	13.975	-1.637	10.81%		APRIL 2010
mBin.Apr	-26.054	7.413	-3.515	0.10%		APRIL
mBin.May	-54.051	8.772	-6.162	0.00%		MAY
mBin.Jun	-72.060	8.878	-8.117	0.00%		JUNE
mBin.Jul	-82.098	9.079	-9.042	0.00%		JULY
mBin.Aug	-92.722	9.059	-10.236	0.00%		AUGUST
mBin.Sep	-93.967	8.828	-10.644	0.00%		SEPTEMBER
mBin.Oct	-81.649	8.245	-9.903	0.00%		OCTOBER
mBin.Nov	-44.793	6.820	-6.568	0.00%		NOVEMBER
AR(1)	0.573	0.116	4.938	0.00%		

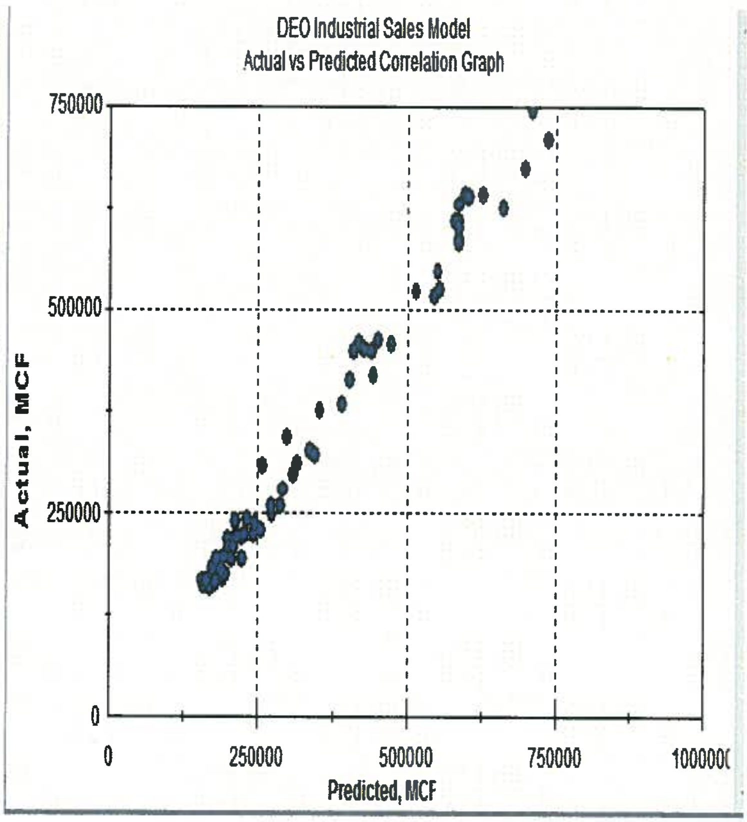
Model Statistics	
Iterations	13
Adjusted Observations	63
Deg. of Freedom for Error	49
R-Squared	0.953
Adjusted R-Squared	0.941
AIC	5.535
BIC	6.011
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-249.75
Model Sum of Squares	209,061.04
Sum of Squared Errors	10,236.61
Mean Squared Error	208.91
Std. Error of Regression	14.45
Mean Abs. Dev. (MAD)	9.06
Mean Abs. % Err. (MAPE)	0.63%
Durbin-Watson Statistic	1.896
Durbin-H Statistic	#NA
Ljung-Box Statistic	12.28
Prob (Ljung-Box)	0.9766
Skewness	0.783
Kurtosis	10.082
Jarque-Bera	138.110
Prob (Jarque-Bera)	0.0000



DEO INDUSTRIAL FIRM SALES FORECAST, MCF

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mDegreeDays_B.HDD_B_59	519.580	10.383	50.042	0.00%		BILLED HEATING DEGREE DAY, BASE 59
Econ.GDP_REAL_MFG	2.734	0.150	18.242	0.00%		OH REAL GROSS PRODUCT--MANUFACTURING
CGE_LagPrice.PriceLag_IND	-5631.877	2215.128	-2.542	1.33%		PROJECTED REAL GAS PRICE, INDUSTRIAL: LAGGED 11 MONTHS
AR(1)	0.343	0.116	2.966	0.42%		
AR(2)	0.394	0.116	3.400	0.11%		

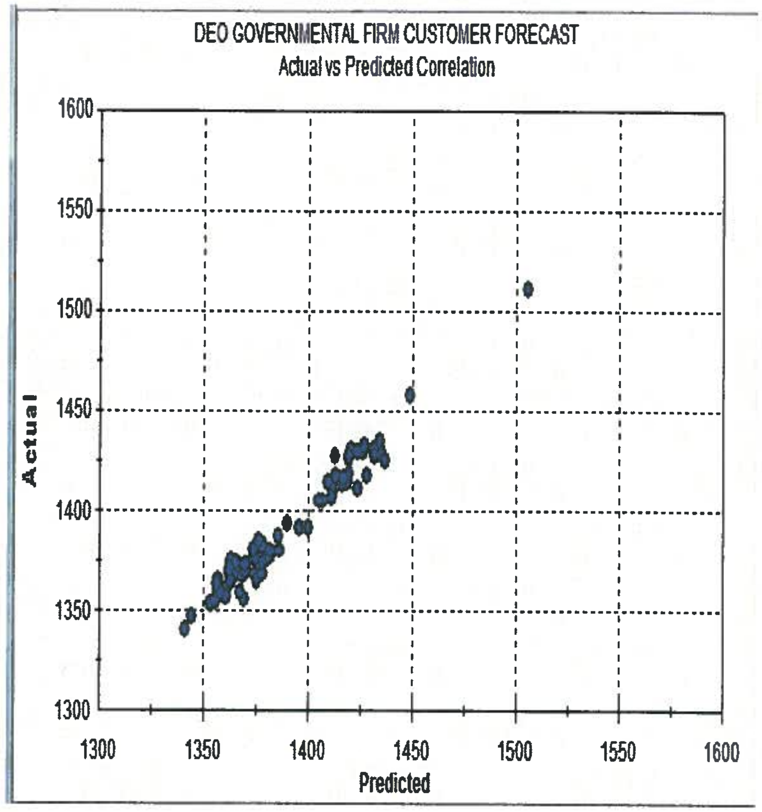
Model Statistics	
Iterations	13
Adjusted Observations	73
Deg. of Freedom for Error	68
R-Squared	0.986
Adjusted R-Squared	0.985
AIC	20.053
BIC	20.210
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-830.51
Model Sum of Squares	2,284,875,436,321.80
Sum of Squared Errors	32,555,442,205.75
Mean Squared Error	478,756,503.03
Std. Error of Regression	21,880.51
Mean Abs. Dev. (MAD)	16,922.42
Mean Abs. % Err. (MAPE)	5.31%
Durbin-Watson Statistic	1.889
Durbin-H Statistic	#NA
Ljung-Box Statistic	13.78
Prob (Ljung-Box)	0.9516
Skewness	0.496
Kurtosis	2.579
Jarque-Bera	3.529
Prob (Jarque-Bera)	0.1713



DEO GOVERNMENTAL FIRM CUSTOMER FORCAST

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mFORGASMODELS.OPA_eCUST_forGAS	0.387	0.002	237.404	0.00%		ELECTRIC OPA CUSTOMER FORECAST, DRIVEN BY PROJECTED GOVERNMENT EMPLOYMENT
mBin.JUN_2008	34.717	4.973	6.982	0.00%		JUNE 2008
mBin.AUG_2008	-7.450	4.888	-1.524	13.24%		AUGUST 2008
mBin.JAN_2009	80.083	4.863	16.467	0.00%		JANUARY 2009
mBin.FEB_2011	22.806	4.868	4.684	0.00%		FEBRUARY 2011
mBin.MAR_2013	-23.426	4.862	-4.818	0.00%		MARCH 2013
mBin.DEC_2012	7.197	4.862	1.480	14.37%		DECEMBER 2012
mBin.May	-5.593	2.028	-2.758	0.76%		MAY
mBin.Oct	-8.405	1.986	-4.232	0.01%		OCTOBER
AR(1)	0.870	0.066	13.166	0.00%		

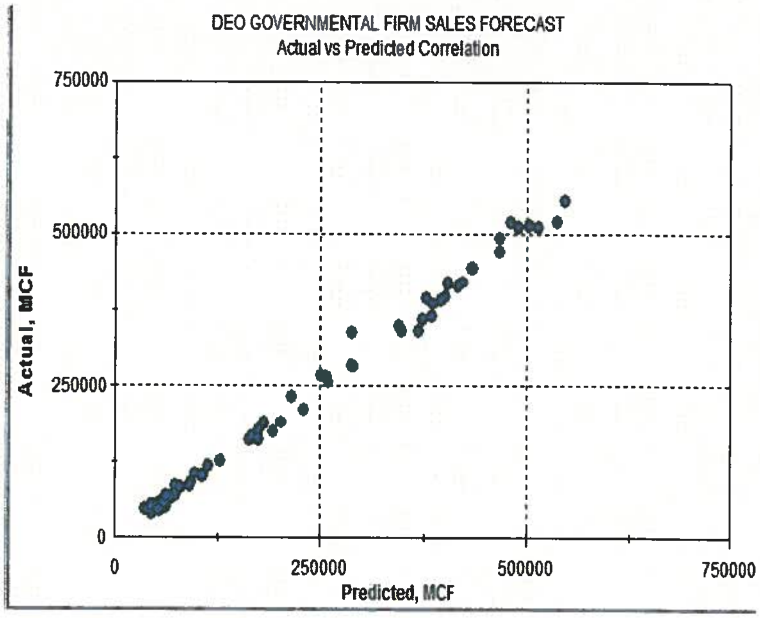
Model Statistics	
Iterations	12
Adjusted Observations	74
Deg. of Freedom for Error	64
R-Squared	0.962
Adjusted R-Squared	0.956
AIC	3.865
BIC	4.176
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-238.00
Model Sum of Squares	67,478.62
Sum of Squared Errors	2,693.87
Mean Squared Error	42.09
Std. Error of Regression	6.49
Mean Abs. Dev. (MAD)	4.83
Mean Abs. % Err. (MAPE)	0.35%
Durbin-Watson Statistic	1.903
Durbin-H Statistic	#NA
Ljung-Box Statistic	24.47
Prob (Ljung-Box)	0.4349
Skewness	-0.146
Kurtosis	2.650
Jarque-Bera	0.640
Prob (Jarque-Bera)	0.7262



DEO GOVERNMENTAL FIRM SALES FORECAST MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mReport.FCUST_OPA	56.255	6.142	9.160	0.00%		GAS OPA CUSTOMER FORECAST
mDegreeDays_B.HDD_B_59	456.302	11.584	39.390	0.00%		BILLED HEATING DEGREE DAY, BASE 59
CGE_RealPrice.OPA	-1467.567	927.162	-1.583	11.85%		REAL GOVERNMENTAL PRICE, NO LAG
mBin.May	-11063.259	6538.151	-1.692	9.56%		MAY
mBin.Jun	-17809.374	8489.524	-2.098	3.99%		JUNE
mBin.Jul	-29752.819	9267.876	-3.210	0.21%		JULY
mBin.Aug	-29846.255	9625.277	-3.101	0.29%		AUGUST
mBin.Sep	-23476.842	9660.106	-2.430	1.79%		SEPTEMBER
mBin.Oct	-20700.436	9031.234	-2.292	2.53%		OCTOBER
mBin.Nov	-15929.528	6718.573	-2.371	2.08%		NOVEMBER
AR(1)	0.593	0.111	5.337	0.00%		

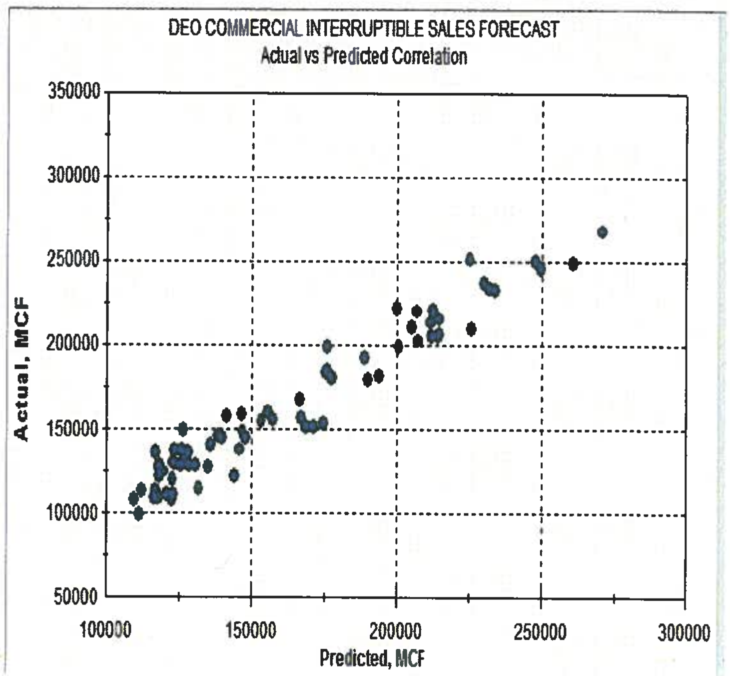
Model Statistics	
Iterations	19
Adjusted Observations	74
Deg. of Freedom for Error	63
R-Squared	0.995
Adjusted R-Squared	0.994
AIC	19.096
BIC	19.438
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-800.54
Model Sum of Squares	2,001,714,140,928.33
Sum of Squared Errors	10,795,635,008.20
Mean Squared Error	171,359,285.84
Std. Error of Regression	13,090.43
Mean Abs. Dev. (MAD)	8,340.72
Mean Abs. % Err. (MAPE)	5.78%
Durbin-Watson Statistic	2.133
Durbin-H Statistic	#NA
Ljung-Box Statistic	21.06
Prob (Ljung-Box)	0.6352
Skewness	1.162
Kurtosis	6.875
Jarque-Bera	62.938
Prob (Jarque-Bera)	0.0000



DEO COMMERCIAL INTERRUPTIBLE SALES FORECAST MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
mDegreeDays_B.HDD_B_59	115.664	7.547	15.326	0.00%		BILLED HEATING DEGREE DAY, BASE 59
Econ.GDP_REAL_NONMFG	0.392	0.013	29.148	0.00%		OH REAL NON-MANUFACTURING GDP
mCalendar.Feb	-24800.842	4983.135	-4.977	0.00%		FEBRUARY
mCalendar.Mar	-18685.941	5390.883	-3.466	0.10%		MARCH
mCalendar.Apr	-23828.725	6011.531	-3.964	0.02%		APRIL
mCalendar.May	-14144.345	6568.667	-2.153	3.51%		MAY
mCalendar.Jun	-18047.448	6814.916	-2.648	1.02%		JUNE
mCalendar.Jul	-13405.282	6754.928	-1.985	5.16%		JULY
mCalendar.Aug	-21822.358	6467.018	-3.374	0.13%		AUGUST
mCalendar.Sep	-24603.158	5584.704	-4.405	0.00%		SEPTEMBER
AR(1)	0.373	0.118	3.154	0.25%		

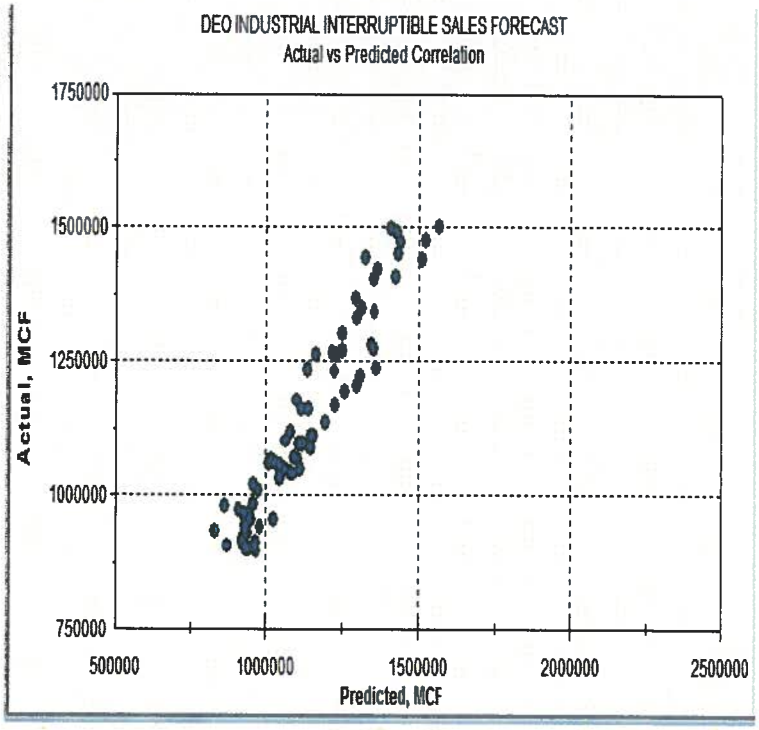
Model Statistics	
Iterations	6
Adjusted Observations	74
Deg. of Freedom for Error	63
R-Squared	0.943
Adjusted R-Squared	0.934
AIC	18.823
BIC	19.166
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-790.46
Model Sum of Squares	135,313,686,334.42
Sum of Squared Errors	8,222,115,993.59
Mean Squared Error	130,509,777.68
Std. Error of Regression	11,424.09
Mean Abs. Dev. (MAD)	8,372.21
Mean Abs. % Err. (MAPE)	5.50%
Durbin-Watson Statistic	2.141
Durbin-H Statistic	#NA
Ljung-Box Statistic	24.73
Prob (Ljung-Box)	0.4207
Skewness	0.144
Kurtosis	2.839
Jarque-Bera	0.334
Prob (Jarque-Bera)	0.8461



DEO INDUSTRIAL INTERRUPTIBLE SALES FORECAST MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
Econ.GDP_REAL_MFG	14.079	0.402	35.059	0.00%		OH REAL GROSS PRODUCT--MANUFACTURING
mDegreeDays_B.HDD_B_59	365.608	38.873	9.405	0.00%		BILLED HEATING DEGREE DAY, BASE 59
mBin.Jan	114901.958	24235.099	4.741	0.00%		JANUARY
mBin.Mar	34123.599	18309.416	1.864	6.68%		MARCH
mBin.Oct	138882.794	23951.387	5.799	0.00%		OCTOBER
mBin.Nov	113040.459	28192.927	4.010	0.02%		NOVEMBER
mBin.Dec	84942.674	28299.261	3.002	0.38%		DECEMBER
AR(1)	0.729	0.083	8.777	0.00%		

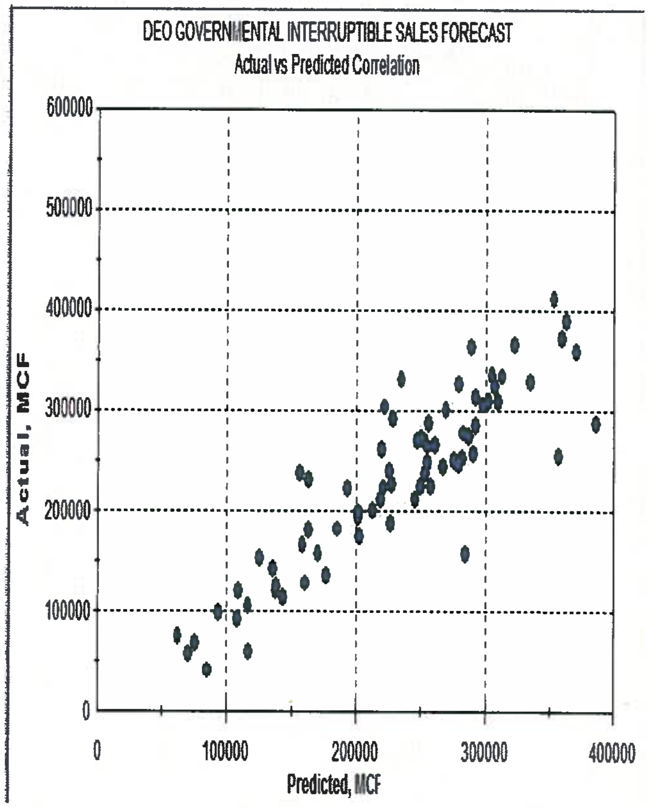
Model Statistics	
Iterations	7
Adjusted Observations	74
Deg. of Freedom for Error	66
R-Squared	0.906
Adjusted R-Squared	0.896
AIC	22.050
BIC	22.299
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-912.84
Model Sum of Squares	2,163,195,430,271.27
Sum of Squared Errors	224,559,386,947.43
Mean Squared Error	3,402,414,953.75
Std. Error of Regression	58,330.22
Mean Abs. Dev. (MAD)	46,785.84
Mean Abs. % Err. (MAPE)	4.08%
Durbin-Watson Statistic	2.176
Durbin-H Statistic	#NA
Ljung-Box Statistic	26.38
Prob (Ljung-Box)	0.3340
Skewness	0.092
Kurtosis	2.274
Jarque-Bera	1.730
Prob (Jarque-Bera)	0.4211



DEO GOVERNMENTAL INTERRUPTIBLE SALES FORECAST MODEL

Variable	Coefficient	StdErr	T-Stat	P-Value	Units	Definition
Econ.GDP_REAL_GOVT	4.678	0.864	5.411	0.00%		OH REAL GROSS PRODUCT---GOVERNMENT
mDegreeDays_B.HDD_B_59	105.068	24.782	4.240	0.01%		BILLED HEATING DEGREE DAY, BASE 59
mBin.Feb	-37168.840	14447.423	-2.573	1.23%		FEBRUARY
mBin.Mar	-29015.828	16711.910	-1.736	8.71%		MARCH
mBin.Apr	-23375.073	14826.293	-1.577	11.95%		APRIL
AR(1)	0.879	0.055	16.066	0.00%		

Model Statistics	
Iterations	6
Adjusted Observations	74
Deg. of Freedom for Error	68
R-Squared	0.802
Adjusted R-Squared	0.788
AIC	21.292
BIC	21.479
F-Statistic	#NA
Prob (F-Statistic)	#NA
Log-Likelihood	-886.82
Model Sum of Squares	451,388,146,964.15
Sum of Squared Errors	111,164,373,546.94
Mean Squared Error	1,634,770,199.22
Std. Error of Regression	40,432.29
Mean Abs. Dev. (MAD)	28,334.17
Mean Abs. % Err. (MAPE)	15.13%
Durbin-Watson Statistic	2.076
Durbin-H Statistic	#NA
Ljung-Box Statistic	20.81
Prob (Ljung-Box)	0.6501
Skewness	-0.323
Kurtosis	4.552
Jarque-Bera	8.716
Prob (Jarque-Bera)	0.0128



(D) DEMAND FORECAST FORMS

(1) SERVICE AREA NATURAL GAS DEMAND

The Duke Energy Ohio and Subsidiary Companies' total natural gas service area includes areas outside of Ohio. The gas load forecast is prepared for the consolidated system that includes the non-Ohio portion of the service area. The forecast for Ohio represents a portion of the consolidated forecast. Form FG1-1 (Parts 1 and 2) contains the history and forecast of gas usage for the Ohio portion of the service area.

(2) GAS DEMAND BY INDUSTRIAL SECTOR

Form FG1-2, "Historical and Forecast Annual Gas Demand by Industrial Sector", provides historic and forecasted gas demands by selected manufacturing sectors displayed according to the Standard Industrial Classification (SIC) Code. It should be noted that "transportation gas" is reflected both in the actual period and the forecast period on Form FG1-2.

(3) MONTHLY GAS SENDOUT

Form FG1-3, "Monthly Ohio Gas Sendout", shows a month by month forecast of total gas sendout, including transportation, for the years 2014, 2015 and 2016 and is based on the forecast detailed in this report.

(4) RANGE OF FORECASTS: HIGHEST, LOWEST, MOST LIKELY

The two major sources of forecast uncertainty were studied in the development of forecast ranges. First, abnormally harsh and abnormally mild weather conditions were employed to generate high and low forecasts. For the second study, alternate economic scenarios - optimistic and pessimistic - were used to set the bounds for a high and a low forecast. The most likely forecast relied upon normal weather and a base-case economic forecast.

Weather-Based Ranges

The overall level of Duke Energy Ohio's gas sales are highly sensitive to weather conditions. If an extreme weather situation develops, there can be a large difference between actual and projected sales. For system sendout, variability in the forecast depends upon the level of heating degree days.

In a simulation study, the gas energy model was solved using weather that was colder than normal and warmer than normal based on heating degree days, respectively. Using the results of these simulations, ranges were developed to show the sensitivity of gas sales to the weather.

The upper band for total gas sendout reflects a ten percent increase above normal in the number of heating degree days. Similarly, the lower band represents a ten percent decrease below normal in the number of heating degree days.

In another simulation study, a gas peak model was solved fifty separate times using the weather that occurred in each of the winter seasons between 1964 and 2013. Using the results of these simulations, probability ranges were developed to show the sensitivity of the gas peak to the weather and to develop forecasts of the gas peak under abnormal weather conditions.

The upper limit to the band for the gas peak reflects a five percent probability that weather conditions will be more severe than those that generated the upper band. Similarly, the lower limit to the band represents a five percent probability that weather conditions could be milder than those used to generate the band.

Form FG1-4(a) provides the forecasts of sendout and peak day deliveries expected under the alternate weather conditions.

Confidence Interval Based Ranges

The most likely forecast of gas energy load is generated using base-case forecasts of numerous economic variables and under the assumption of normal weather. The source of the national economic forecast is Moody's Analytics.

In generating the high and low forecasts, the Company used the standard errors of the regression from the econometric models used to produce the base energy forecast. The bands are based on a 95% confidence interval around the forecast which equates to +/-1.96 standard deviations. These calculations were used to adjust the base forecast up or down, thus providing high and low bands around the most likely forecast. In general, the upper band reflects relatively optimistic assumptions about the future growth of gas sales while the lower band depicts the impact of a pessimistic scenario.

In Form FG1-4(b), forecasts of industrial gas usage and total energy usage are provided for the high, low, and most likely forecasts.

(5) PEAK AND FORECAST DESIGN DAY REQUIREMENTS

The detailed information to complete Form FG1-5, "Historic Peak and Forecast Design Day requirements," is not available. Duke Energy Ohio does not forecast peak day requirements by sector, but only by total system requirements as discussed in Section (C)(1)(a) of this report. For forecasting purposes, the simulation study that produced the weather-based ranges discussed above is also used to determine peak design day requirements. The peak day design level chosen reflects a three percent probability that peak load will be more severe than the peak day design level. For operating purposes, it is Duke Energy Ohio's policy to supply all firm requirements at temperatures that can reasonably be expected to occur. Accordingly, Duke Energy Ohio's supply projections on design peak day have a margin of safety in the propane volumes required.

(6) SELF-HELP AND OTHER TRANSPORTED GAS

Form FG1-6 provides the forecast of self-help and transportation gas.

DUKE ENERGY OHIO
4901:5-7-03

DUKE ENERGY OHIO

FORM FG1-1: HISTORICAL AND FORECAST SERVICE AREA ANNUAL GAS DEMAND
UNITS: MMCF/YEAR
COMPANY: DUKE ENERGY OHIO AVERAGE BTU CONTENT: 1021.0

	YEAR	(1) RESIDENTIAL SALES	(2) COMMERCIAL SALES[1]	(3) INDUSTRIAL SALES	(4) SALES TO ELECTRIC UTILITIES	(5) SALES TO ULTIMATE CUSTOMERS (1)+(2)+(3)+(4)	(6) SALES FOR RESALE[2]	(7) OTHER SALES FOR RESALE	(8) TOTAL SALES (5)+(6)+(7)	(9) COMPANY USE[3]	(10) TOTAL CONSUMPTION (8)+(9)	(11) NET[4] INJECTIONS TO STORAGE	(12) LOSSES AND UFG	(13) TOTAL DEMAND (10)+(11)+(12)	(14) SUM OF INTERRUPTIBLE INCLUDED IN COL (1) THRU (4)	(15) TOTAL INJECTIONS TO STORAGE	(16) TOTAL WITHDRAWAL FROM STORAGE
-5	2009	22,890	9,341	1,261		33,492	0	0	33,492	51	33,543	-1,011	443	32,975	0	8,871	9,882
-4	2010	21,460	8,567	1,037		31,064	0	0	31,064	55	31,118	-609	411	30,920	0	8,901	9,510
-3	2011	19,630	7,546	873		28,049	0	0	28,049	46	28,095	539	371	29,005	0	8,704	8,164
-2	2012	14,801	5,763	694		21,257	0	0	21,257	46	21,304	-242	281	21,343	0	7,562	7,804
-1	2013	9,960	4,182	771		14,913	0	0	14,913	46	14,959	-308	198	14,849	0	8,478	8,785
0	2014	14,637	7,060	1,140		22,838	0	0	22,838	41	22,879	0	302	23,181	0	8,321	8,321
1	2015	13,176	6,403	975		20,554	0	0	20,554	36	20,590	0	272	20,862	0	8,321	8,321
2	2016	13,249	6,426	975		20,651	0	0	20,651	36	20,686	0	273	20,960	0	8,321	8,321
3	2017	13,237	6,414	991		20,642	0	0	20,642	36	20,678	0	273	20,951	0	8,321	8,321
4	2018	13,388	6,466	1,014		20,869	0	0	20,869	36	20,904	0	276	21,180	0	8,321	8,321
5	2019	13,462	6,492	1,035		20,988	0	0	20,988	36	21,024	0	278	21,302	0	8,321	8,321
6	2020	13,518	6,508	1,057		21,083	0	0	21,083	36	21,119	0	279	21,398	0	8,321	8,321
7	2021	13,497	6,490	1,076		21,063	0	0	21,063	36	21,099	0	279	21,378	0	8,321	8,321
8	2022	13,566	6,507	1,098		21,170	0	0	21,170	36	21,206	0	280	21,486	0	8,321	8,321
9	2023	13,464	6,457	1,112		21,033	0	0	21,033	36	21,069	0	278	21,347	0	8,321	8,321
10	2024	13,725	6,550	1,141		21,416	0	0	21,416	36	21,451	0	283	21,735	0	8,321	8,321

[1] Includes Sales to Other Public Authorities, Interdepartmental Sales, and Street Lighting

[2] Includes municipals and small natural gas companies

[3] Includes Lease and Plant Fuel and Pipeline Fuel if applicable

[4] Net Injections to Storage (NITS) = Total Injections to Storage (Column 15) - Total Withdrawal from Storage (Column 16). NITS<0, then NITS = 0

DUKE ENERGY OHIO
4901:5-7-03

FORM FG1-2: HISTORICAL AND FORECAST OF ANNUAL GAS DEMAND BY INDUSTRIAL SECTOR (MMCF/YEAR)

AVERAGE BTU CONTENT: 1021.0 (FOR THE YEAR 2013)

		(1) 311, 312	(2) 22, 23	(3) 26	(4) 27	(5) 29	(6) 28	(7) 30	(8) 32	(9) 33	(10) 34	(11) 35	(12) 36	(13) 37	(14)	(15)
	YEAR	FOOD, BEVERAGE AND TOBACCO MFG	APPAREL MFG	PAPER AND ALLIED PRODUCT MFG	PRINTING AND RELATED SUPPORT ACTIVITIES	PETROLEUM AND COAL PRODUCTS MFG	CHEMICAL PRODUCT MFG	PLASTICS AND RUBBER PRODUCTS MFG	NON-METALLIC MENERAL PRODUCTS MFG	PRIMARY METAL MFG	FABRICATED METAL PRODUCT MFG	MACHINERY MFG	ELECTRICIAL EQUIPMENT, APPLIANCE AND COMPONENT MFG	TRANSPORTATION EQUIPMENT MFG	ALL OTHER INDUSTRIALS	TOTAL INDUSTRIALS[1]
-5	2009	1,598	90	1,435	608	433	4,102	416	408	740	1,924	1,520	762	1,634	552	16,223
-4	2010	1,675	95	1,504	637	453	4,297	436	428	775	2,016	1,592	798	1,712	578	16,996
-3	2011	1,729	98	1,553	658	468	4,438	450	442	800	2,082	1,645	825	1,768	597	17,553
-2	2012	1,109	99	1,627	1,019	142	3,685	519	521	1,176	2,336	2,023	930	2,165	817	18,169
-1	2013	1,518	103	1,712	882	198	4,150	506	600	1,299	2,416	2,103	886	2,389	841	19,602
0	2014	1,619	110	1,826	940	211	4,426	539	640	1,386	2,577	2,242	945	2,548	897	20,905
1	2015	1,603	109	1,808	931	209	4,383	534	634	1,372	2,552	2,221	935	2,524	888	20,703
2	2016	1,644	112	1,855	955	215	4,496	548	650	1,408	2,618	2,278	960	2,589	911	21,238
3	2017	1,689	115	1,905	981	220	4,617	562	667	1,445	2,688	2,339	985	2,658	936	21,808
4	2018	1,733	118	1,955	1,007	226	4,739	577	685	1,484	2,759	2,401	1,011	2,729	960	22,386
5	2019	1,777	121	2,004	1,032	232	4,858	592	702	1,521	2,828	2,461	1,037	2,797	984	22,945
6	2020	1,824	124	2,057	1,060	238	4,987	607	721	1,561	2,903	2,527	1,064	2,871	1,011	23,556
7	2021	1,870	127	2,110	1,087	244	5,114	623	739	1,601	2,977	2,591	1,091	2,944	1,036	24,153
8	2022	1,918	130	2,164	1,115	250	5,246	639	758	1,642	3,054	2,658	1,119	3,020	1,063	24,777
9	2023	1,961	133	2,212	1,140	256	5,363	653	775	1,679	3,122	2,717	1,144	3,088	1,087	25,331
10	2024	2,012	137	2,270	1,169	263	5,501	670	795	1,722	3,203	2,787	1,174	3,167	1,115	25,985

1 THE TOTAL INDUSTRIAL COLUMN IS EQUAL TO THE SUM OF ALL PREVIOUS ITEMS (1) THROUGH (15)

NOTE: THESE FIGURES INCLUDE TRANSPORTATION AND INTERRUPTIBLE GAS

DUKE ENERGY OHIO

FORM FG11-3: MONTHLY OHIO GAS SENDOUT (MMCF)

COMPANY: DUKE OHIO

AVERAGE BTU CONTENT: 1021.0

	YEAR 0	YEAR 1	YEAR 2
JANUARY	13,079	10,401	10,422
FEBRUARY	10,627	9,250	9,375
MARCH	8,106	6,541	6,563
APRIL	3,302	3,299	3,320
MAY	1,832	1,828	1,850
JUNE	1,395	1,403	1,425
JULY	1,262	1,271	1,293
AUGUST	1,227	1,238	1,261
SEPTEMBER	1,290	1,301	1,323
OCTOBER	2,856	2,866	2,887
NOVEMBER	5,463	5,477	5,498
DECEMBER	9,205	9,222	9,243

DUKE ENERGY OHIO
4901-5-7-01
FORM FG1-4a RANGE OF DEMAND FORECASTS
WEATHER BANDS FOR SENDOUT (MCF)
SENDOUT

YEAR	MILD	BASE	HARSH
2014	75,643,606	79,886,575	83,969,564
2015	71,541,564	75,041,270	78,838,249
2016	72,471,807	75,543,356	79,789,220
2017	73,185,112	75,892,753	80,481,797
2018	73,933,896	76,347,737	81,230,581
2019	74,662,715	76,819,234	81,959,400
2020	75,564,323	77,487,217	82,881,737
2021	76,241,795	77,918,905	83,538,479
2022	77,014,459	78,463,366	84,311,143
2023	77,769,033	78,999,665	85,065,718
2024	78,590,360	79,625,463	85,907,774

PEAK DAY DELIVERIES AND
PROBABILITY OF EXCEEDING (MCF)[1]

YEAR	TOTAL	FIRM PEAKS			
	50%	50%	5%	3%	1%
2014	674,980	619,936	742,754	760,300	793,599
2015	676,520	620,107	742,959	760,509	793,818
2016	675,390	620,285	743,173	760,728	794,046
2017	675,626	620,477	743,403	760,964	794,292
2018	675,846	620,658	743,620	761,186	794,524
2019	677,443	620,859	743,860	761,432	794,781
2020	676,288	621,006	744,036	761,612	794,968
2021	676,470	621,153	744,212	761,792	795,157
2022	676,649	621,297	744,385	761,969	795,342
2023	678,149	621,436	744,552	762,139	795,519
2024	677,002	621,581	744,726	762,318	795,705

[1]The column headings give the probability of experiencing more severe weather conditions.

DUKE ENERGY OHIO
4901:5-7-01
FORM FG1-4b: RANGE OF DEMAND FORECASTS

ECONOMIC BANDS
FOR INDUSTRIAL, SENDOUT, AND PEAK
(MCF)

	PESSIMISTIC	BASE	OPTMISTIC
INDUSTRIAL			
2014	19,651,531	19,887,855	20,124,180
2015	19,246,079	19,482,404	19,718,729
2016	19,214,013	19,450,338	19,686,662
2017	19,187,510	19,423,835	19,660,160
2018	19,110,023	19,346,347	19,582,672
2019	19,058,117	19,294,442	19,530,767
2020	19,042,177	19,278,502	19,514,826
2021	19,006,353	19,242,677	19,479,002
2022	18,977,423	19,213,747	19,450,072
2023	18,958,730	19,195,055	19,431,380
2024	18,952,229	19,188,553	19,424,878
SENDOUT			
2014	73,409,196	74,320,968	75,232,741
2015	72,478,183	73,389,955	74,301,728
2016	72,787,989	73,699,762	74,611,534
2017	72,883,763	73,795,536	74,707,309
2018	72,998,122	73,909,894	74,821,667
2019	73,109,170	74,020,943	74,932,715
2020	73,376,124	74,287,897	75,199,670
2021	73,386,328	74,298,100	75,209,873
2022	73,501,312	74,413,084	75,324,857
2023	73,617,808	74,529,580	75,441,353
2024	73,835,696	74,747,469	75,659,242
PEAK			
2014	638,435	674,980	708,028
2015	639,657	676,520	709,841
2016	638,392	675,390	708,816
2017	638,628	675,626	709,050
2018	638,949	675,846	709,187
2019	640,624	677,443	710,727
2020	639,712	676,288	709,362
2021	640,064	676,470	709,401
2022	640,416	676,649	709,438
2023	642,018	678,149	710,860
2024	641,102	677,002	709,515

DUKE ENERGY OHIO
4901:5-7-03

FORM FG1-5: HISTORIC PEAK AND FORECAST DESIGN DAY REQUIREMENTS
UNITS: MMCF/DAY
COMPANY: DUKE ENERGY OHIO AVERAGE BTU CONTENT: 1021.0

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	YEAR	RESIDENTIAL SALES	COMMERCIAL[1] SALES	INDUSTRIAL SALES	SALES TO ELECTRIC UTILITIES	SALES TO ULTIMATE CUSTOMERS	SALES FOR RESALE TO MUNICIPALS AND SMALL NATURAL GAS CO.	OTHER SALES FOR RESALE	TOTAL SALES	UNACCOUNTED FOR	TOTAL[2]
						(1)+(2)+(3)+(4)			(5)+(6)+(7)		(8)+(9)
-5	2009	0	0	0	0	0	0	0	0	0	477
-4	2010	0	0	0	0	0	0	0	0	0	400
-3	2011	0	0	0	0	0	0	0	0	0	404
-2	2012	0	0	0	0	0	0	0	0	0	350
-1	2013	0	0	0	0	0	0	0	0	0	298
0	2014	0	0	0	0	0	0	0	0	0	385
1	2015	0	0	0	0	0	0	0	0	0	401
2	2016	0	0	0	0	0	0	0	0	0	401
3	2017	0	0	0	0	0	0	0	0	0	402
4	2018	0	0	0	0	0	0	0	0	0	402
5	2019	0	0	0	0	0	0	0	0	0	402
6	2020	0	0	0	0	0	0	0	0	0	402
7	2021	0	0	0	0	0	0	0	0	0	402
8	2022	0	0	0	0	0	0	0	0	0	403
9	2023	0	0	0	0	0	0	0	0	0	403
10	2024	0	0	0	0	0	0	0	0	0	403

1 Includes Sales to Other Public Authorities, Interdepartmental Sales, and Street Lighting
2 Does not include gas supply obtained from unregulated suppliers through the FT and RFT services.

DUKE ENERGY OHIO
4901:5-7-03

FORM FG1-6: SUPPLY AND DISPOSITION OF SELF-HELP AND OTHER TRANSPORTED VOLUMES
UNITS: MMCF/YEAR
COMPANY: DUKE ENERGY OHIO

	YEAR	(1) OHIO PRODUCED GAS TRANSPORTED SOLELY BY RESPONDENT FOR ON-SYSTEM CUSTOMERS	(2) OHIO PRODUCED GAS TRANSPORTED FROM OTHER COMPANY TO RESPONDENT FOR ON-SYSTEM CUSTOMERS	(3) OTHER VOLUMES TRANSPORTED BY RESPONDENT FOR ON-SYSTEM CUSTOMERS	(4) TOTAL VOLUMES TRANSPORTED BY RESPONDENT FOR ON-SYSTEM CUSTOMERS (1)+(2)+(3)	(5) OHIO PRODUCED GAS TRANSPORTED OFF-SYSTEM BY RESPONDENT	(6) OTHER VOLUMES TRANSPORTED BY RESPONDENT FOR OFF-SYSTEM CUSTOMERS	(7) TOTAL VOLUMES TRANSPORTED BY RESPONDENT FOR OFF-SYSTEM CUSTOMERS (5)+(6)	(8) TOTAL VOLUMES TRANSPORTED (4) + (7)
-5	2009	0	0	36,056	36,056	0	0	0	36,056
-4	2010	0	0	41,418	41,418	0	0	0	41,418
-3	2011	0	0	41,193	41,193	0	0	0	41,193
-2	2012	0	0	23,881	23,881	0	0	0	23,881
-1	2013	0	0	25,414	25,414	0	0	0	25,414
0	2014	0	0	37,396	37,396	0	0	0	37,396
1	2015	0	0	33,319	33,319	0	0	0	33,319
2	2016	0	0	33,469	33,469	0	0	0	33,469
3	2017	0	0	33,481	33,481	0	0	0	33,481
4	2018	0	0	33,882	33,882	0	0	0	33,882
5	2019	0	0	34,112	34,112	0	0	0	34,112
6	2020	0	0	34,303	34,303	0	0	0	34,303
7	2021	0	0	34,301	34,301	0	0	0	34,301
8	2022	0	0	34,508	34,508	0	0	0	34,508
9	2023	0	0	34,311	34,311	0	0	0	34,311
10	2024	0	0	34,971	34,971	0	0	0	34,971

Column (3) - Represents contracted seasonal firm supply.
Column (10) - Includes storage withdrawal volumes from Columbia Gas Transmission and Texas Gas NNS.

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4901: 5-7-04 GAS AND NATURAL GAS SUPPLY FORECASTS FOR GAS DISTRIBUTION COMPANIES SERVING MORE THAN FIFTEEN THOUSAND CUSTOMERS

(A) General Guidelines

No response required.

(B) Special Subject Areas

Duke Energy Ohio has historically purchased Ohio-produced gas if supply is reliable and the price is competitive. However, Duke Energy Ohio's ability to purchase Ohio-produced gas is limited. The Company's service territory is not conducive to natural gas formation. Most of Ohio's oil and gas wells are located in the northeast region of the state. Duke Energy Ohio monitors the delivered price of Appalachian gas supplies (which includes Ohio-produced gas) and compares it to the price of delivered natural gas from other supply regions in the United States.

Duke Energy Ohio's contract to purchase recovered methane gas from the Rumpke Sanitary Landfill represents a source of Ohio gas. The Rumpke Sanitary Landfill is located in Colerain Township, Hamilton County, Ohio. The recovered methane is mixed with flowing natural gas in Duke Energy Ohio's distribution system and delivered to customers. As of September 1, 2009, the recovered methane gas is sold directly to a third party which then sells it to Duke Energy Ohio for distribution to its customers. The recovery of methane gas has several environmental benefits: it reduces methane gas emissions that escape from the landfill and enter the Earth's atmosphere; it reduces the danger of explosion to surrounding buildings; and it reduces odors from the landfill. Global warming is a concern of nations worldwide. Duke Energy Ohio's involvement in the Rumpke Landfill methane recovery project partially addresses two of the Company's commitments: one, to the Department of Energy's Climate Challenge program; and two, to the Environmental Protection Agency's Landfill Methane Outreach Program.

(C) Gas and Natural Gas Supply Forecast Discussion

(1) Duke Energy Ohio's historical and projected supply of gas, by source, are shown in Section 4901:5-7-04 (1), on Form FG2-1, Annual Gas Supply.

In 2006, Duke Energy Ohio began negotiating long-term supply contracts, with the price based on a published index or fixed as part of the Company's hedging program, for a portion of its supply requirements. Duke Energy Ohio continues to rely on contracts for short-term, seasonal supply for the majority of the requirements to serve its firm sales customers. This strategy allows greater flexibility for changes in demand, while providing a portfolio of fixed and indexed prices. A small portion of winter supply is sometimes purchased on the daily spot market. Summer supply is purchased through firm seasonal contracts or monthly spot market purchases depending on market conditions during the preceding spring.

Duke Energy Ohio's supply contracts include provisions that allow for a variety of pricing structures (i.e. index, fixed price, price caps and collars). The strategy is to lower the risk of price volatility. The contracted firm supply may have a premium attached by the supplier for that service.

Duke Energy Ohio also owns two propane peak-shaving plants and has access to 64% of a plant owned by Duke Energy Kentucky. However, one of those plants, Dick's Creek, is currently unavailable due to a leak in the Todhunter cavern, which stores the propane for use in the Dick's Creek plant. Todhunter is operated by Enterprise TE Products Pipeline Company, which declared force majeure for the remaining term of the contract on December 13, 2013. The two operational facilities yield a combined total of 135,940 per day in equivalent dekatherms for peak day usage.

(2) Historical and projected gas prices by supplier are shown in Section 4901:5 7-04 (G) (2), on Form FG2-2, Gas Supply Prices. Future prices are primarily based upon NYMEX futures prices, utilizing current rates on each pipeline.

(3) Duke Energy Ohio does not own any storage facilities. Duke Energy Ohio has storage capacity on the Columbia Gas Transmission system, and the Texas Gas Transmission system.

(D) Projected Sources of Gas

(1) Form FG2-1, Annual Gas Supply in Section 4901:5-7-04 (G) (1), shows Duke Energy Ohio's historical and projected supply of gas by source. Projected supply is predominantly expected to come from "All other interstate supply", which represents amounts to be purchased through seasonal firm contracts. Current long term contracts are carried out through their date of termination. It is assumed that injections will equal withdrawals on an annual basis, so the net withdraws are projected to be zero. Duke Energy Ohio does not have company-owned gas. Duke Energy Ohio does not own, nor is it currently proposing to construct, any storage facilities, nor lease storage facilities outside of its gas service area at this time.

It is anticipated that the FERC and PUCO will continue to advocate open access, nondiscriminatory transportation on interstate pipelines, as evidenced in FERC Order #636, and on the local distribution companies' systems, as evidenced by PUCO Order #85-800. Correspondingly, Duke Energy Ohio is continuing the process of unbundling traditional utility services to small industrial, commercial and residential customers through its Firm Transportation (FT) and Residential Firm Transportation (RFT) services. Participating customers have the option under this program of directly securing gas supply from unregulated suppliers. Those volumes are transported on various interstate pipelines that serve Duke Energy Ohio. Once delivered at the utility's city gate, Duke Energy Ohio has the obligation to deliver, on a firm basis, such volumes to burner tip.

In response to Duke Energy Ohio's FT and RFT Programs, Duke Energy Ohio continuously reviews its gas procurement upstream pipeline contracts in order to limit contract commitment costs from pipelines and suppliers for unused capacity or supply due to sales customers switching to transportation service on Duke Energy Ohio's system. In addition, Duke Energy Ohio's collaborative process resulted in changes to the FRAS tariff to allow for assignment of upstream interstate pipeline capacity as participation in the FT and RFT programs grows.

(2) Duke Energy Ohio is only proposing to construct those facilities identified in 4901:5-7-05(B)(2).

DUKE ENERGY OHIO
CITY GATE PEAK DAY FIRM CAPACITY (DTH/D)

	1/1/14	1/1/15	1/1/16
PIPELINE FT:			
TEXAS GAS	36,250	48,250	48,250
TENN/KO TRANS	0	0	0
COL GULF/KO TRANS	136,942	69,380	69,380
PANHANDLE/TEXAS EASTERN	0	0	0
TOTAL FT	173,192	117,630	117,630
PIPELINE STORAGE:			
COLUMBIA GAS FSS	216,514	216,514	216,514
TEXAS GAS NNS	25,000	25,000	25,000
TOTAL STORAGE	241,514	241,514	241,514
TOTAL UPSTREAM CAPACITY	414,706	359,144	359,144
PROPANE	135,940	135,940	135,940
PEAKING/City Gate SERVICE	16,000	34,867	
TOTAL PEAK CAPACITY	566,646	529,951	495,084
PEAK DAY DESIGN*	815,819	816,044	816,279

(*) – Includes peak day requirements for the RFT/FT customers.

SEASONAL STORAGE
QUANTITIES

	1/1/14	1/1/15	1/1/16
COLUMBIA FSS	9,244,079	9,244,079	9,244,079
TEXAS GAS NNS	2,350,000	2,350,000	2,350,000

(E) Reliability of Gas Sources

(1) Reliable gas sources are those gas suppliers with industry experience, and in which Duke Energy Ohio has confidence in the deliverability of contracted amounts of gas to Duke Energy Ohio on a peak day, seasonal and/or annual basis without interruption.

(2) Duke Energy Ohio believes that to ensure a reliable supply of gas on peak days and on a seasonal/annual basis, it is necessary to diversify its "firm" gas purchases among proven gas suppliers with the capability to deliver gas into pipelines connected to, or located near, Duke Energy Ohio's gas service area. It is Duke Energy Ohio's policy to assure its firm (core) customers, those with no alternate fuel capability, with the most reliable gas supplies. Utilizing storage capacity, firm interstate pipeline capacity, and proven gas suppliers currently provides the most reliable gas supplies. Duke Energy Ohio continues to monitor the reliability factor regarding its gas supply sources and to determine potential changes from state and federal orders and/or rules.

(3) The reliability of Duke Energy Ohio's suppliers regarding peak day gas supply over the past five (5) years has been near 100%. During the winter of 2013-2014, the supplier providing peaking service delivered to Duke Energy Ohio's city gate failed to deliver the full contracted volume on 2 days. The cut volumes were relatively minor, with 8,315 dth cut on January 6, 2014 and 5,293 cut on January 7, 2014. Due to these cuts, the supplier waived the reservation fees for the entire winter, but continued to provide the peaking service. Duke Energy Ohio anticipates that the reliability of supply from its current suppliers will remain high over the forecast period, and will require the winning bidders for peaking service to

provide documentation that they have relevant firm transportation to Duke Energy Ohio's city gate.

(F) Analysis of System Peak and Winter Season Planning

(1) Form FG2-3, Historical Peak and Forecast Design Day Supply, is shown in Section 4901:5-7-04 (G) (3). The design day peak level is based on a simulation study which solves the gas peak model 50 times using actual weather conditions. Duke Energy Ohio calculates a design day peak load, not design day weather conditions. For operating purposes, it is Duke Energy Ohio's policy to supply all firm requirements at temperatures which can reasonably be expected to occur. Duke Energy Ohio periodically reevaluates its design peak day and seasonal firm requirements and associated supply coverage.

Duke Energy Ohio's Load Forecasting Department calculates peak day forecasts in DTHs with 50%, 5%, 4%, 3%, 2% and 1% probabilities of being exceeded. This data is sent to Gas Resources for determining the interstate pipeline capacity portfolio to meet the design peak day. The optimal level of peak day coverage is determined through an expected value analysis comparing the cost of acquiring additional firm capacity or city-gate delivered peaking services with the potential cost of incurring penalties from interstate pipelines for over-withdrawing from storage. Based on this analysis Duke Energy Ohio has selected a coverage level 99%. This is equivalent to a 1% probability of experiencing a peak day that exceeds Duke Energy Ohio's design peak day.

Winter 2014-2015 Design Peak Day	
2015 Peak Day (mcf) See 1% column on page 3-38	793,818
BTU Factor	1.028

Design Peak Day 2014/2015 (dth)	816,044

(G) Supply Forecast Forms

(1) Gas Supplies, Form FG2-1; see page 2-9.

(2) Gas Prices, Form FG2-2; see page 2-10.

(3) Peak and Design Day Supply, Form FG2-3; see page 2-11.

(4) Natural Gas Storage Facilities, Form FG2-4; see page 2-12.

(5) Propane Facilities, Form FG2-5; see page 2-13.

(6) Other Peaking Facilities, Form FG2-6; Duke Energy Ohio owns no peaking facilities other than those identified on Form FG2-5; page 2-14.

SUPPLY FORECAST FORMS

FORM FG2-1: ANNUAL GAS SUPPLY
UNITS: MMCF/YEAR
COMPANY NAME: DUKE ENERGY OHIO

AVERAGE BTU CONTENT: 1021.0

	YEAR	(1) LONG-TERM INTERSTATE SUPPLY	(2) SPOT MKT INTERSTATE SUPPLY	(3) ALL OTHER INTERSTATE SUPPLY	(4) OHIO PRODUCTION	(5) PROPANE	(6) SNG	(7) LNG	(8) OTHER	(9) TOTAL REQUIREMENTS (1) THRU (8)	(10) NET WITHDRAWAL FROM STORAGE	(11) TOTAL SUPPLIES (9) + (10)
BTU				1021.5	976.7	1440.5				1021.0		1021.0
-5	2009	8,530	48	25,329	841	99	–	–	–	34,847	1,011	35,858
-4	2010	8,261	65	23,279	1,214	46	–	–	–	32,865	609	33,474
-3	2011	5,068	-	23,952	1,263	39	–	–	–	30,322	-	30,322
-2	2012	4,394	-	17,832	1,237	6	–	–	–	23,469	242	23,711
-1	2013	2,400	-	20,408	1,324	61	–	–	–	24,193	308	24,501
0	2014	4,200	789	19,323	1,176	330	–	–	–	25,818		25,818
1	2015	3,983	-	19,399	1,176	39	–	–	–	24,597		24,597
2	2016	1,675	-	22,734	588	39	–	–	–	25,036		25,036
3	2017	-	-	25,281	-	39	–	–	–	25,320		25,320
4	2018	-	-	25,482	-	39	–	–	–	25,521		25,521
5	2019	-	-	25,698	-	39	–	–	–	25,737		25,737
6	2020	-	-	26,045	-	39	–	–	–	26,084		26,084
7	2021	-	-	26,329	-	39	–	–	–	26,368		26,368
8	2022	-	-	26,571	-	39	–	–	–	26,610		26,610
9	2023	-	-	26,756	-	39	–	–	–	26,795		26,795
10	2024	-	-	26,966	-	39	–	–	–	27,005		27,005

NOTE:
Column (3) - Represents contracted seasonal firm supply.
Column (10) - Includes net storage withdrawal volumes from Columbia Gas Transmission and Texas Gas NNS.

FORM FG2-2: GAS SUPPLY PRICES
UNITS: $/MCF
COMPANY NAME: DUKE ENERGY OHIO

AVERAGE BTU CONTENT: 1021.0

	YEAR	(1) LONG-TERM INTERSTATE SUPPLY	(2) SPOT MKT INTERSTATE SUPPLY	(3) ALL OTHER INTERSTATE SUPPLY	(4) OHIO PRODUCTION	(5) PROPANE	(6) SNG	(7) LNG	(8) OTHER	(9) WITHDRAWAL FROM STORAGE	(10) TOTAL SUPPLIES (WACOG)
BTU				1021.5		1440.5					1021.0
-5	2009	$7.50	$7.05	$9.56	$4.31	$5.19	–	–	–	$8.09	$8.89
-4	2010	$6.85	$4.72	$5.19	$4.43	$6.51	–	–	–	$6.68	$5.60
-3	2011	$6.09	–	$4.13	$4.10	$6.83	–	–	–	$5.95	$4.46
-2	2012	$5.50	–	$3.85	$2.82	$6.87	–	–	–	$5.43	$4.12
-1	2013	$4.75	–	$4.01	$3.68	$6.87	–	–	–	$4.89	$4.09
0	2014	$4.04	$7.85	$4.44	$4.67	$6.87	–	–	–	$4.36	$4.52
1	2015	$3.97	–	$4.44	$4.12	$6.87	–	–	–	$4.28	$4.35
2	2016	$3.96	–	$4.43	$4.13	$6.87	–	–	–	$4.27	$4.40
3	2017	–	–	$4.48	–	$6.87	–	–	–	$4.28	$4.49
4	2018	–	–	$4.55	–	$6.87	–	–	–	$4.32	$4.55
5	2019	–	–	$4.55	–	$6.87	–	–	–	$4.32	$4.55
6	2020	–	–	$4.55	–	$6.87	–	–	–	$4.32	$4.55
7	2021	–	–	$4.55	–	$6.87	–	–	–	$4.32	$4.55
8	2022	–	–	$4.55	–	$6.87	–	–	–	$4.32	$4.55
9	2023	–	–	$4.55	–	$6.87	–	–	–	$4.32	$4.55
10	2024	–	–	$4.55	–	$6.87	–	–	–	$4.32	$4.55

NOTE:
Column (3) - Represents contracted seasonal firm supply.
Column (9) - Includes storage volumes from Columbia Gas Transmission and Texas Gas NNS.
- Demand Charges associated with the storage and transport are included in the rate.

DUKE ENERGY OHIO, INC
4901: 5-7-04

FORM FG2-3: HISTORICAL PEAK AND FORECASTED DESIGN PEAK DAY
UNITS: MMCF/YEAR
COMPANY NAME: DUKE ENERGY OHIO

AVERAGE BTU CONTENT: 1021.0

	YEAR	(1) LONG-TERM INTERSTATE SUPPLY	(2) SPOT MKT INTERSTATE SUPPLY	(3) ALL OTHER INTERSTATE SUPPLY	(4) OHIO PRODUCTION	(5) PROPANE	(6) SNG	(7) LNG	(8) OTHER	(9) TOTAL REQUIREMENTS (1) THRU (8)	(10) WITHDRAWAL FROM STORAGE	(11) TOTAL SUPPLIES (9) + (10)
BTU				1021.5	976.7	1440.5				1021.0		1021.0
-5	2009	15	-	310	4	24	–	–	–	353	124	477
-4	2010	30	-	230	3	0	–	–	–	263	137	400
-3	2011	21	-	210	4	16	–	–	–	251	153	404
-2	2012	10	-	141	3	0	–	–	–	154	196	350
-1	2013	8	-	90	2	10	–	–	–	110	188	298
0	2014	10	40	98	0	86	–	–	–	234	151	385
1	2015	12	-	64	3	86	–	–	–	165	236	401
2	2016	9	-	67	3	86	–	–	–	165	236	401
3	2017	-	-	80	0	86	–	–	–	166	236	402
4	2018	-	-	80	0	86	–	–	–	166	236	402
5	2019	-	-	80	0	86	–	–	–	166	236	402
6	2020	-	-	80	0	86	–	–	–	166	236	402
7	2021	-	-	80	0	86	–	–	–	166	236	402
8	2022	-	-	81	0	86	–	–	–	167	236	403
9	2023	-	-	81	0	86	–	–	–	167	236	403
10	2024	-	-	81	0	86	–	–	–	167	236	403

NOTE:
Column (3) - Represents contracted seasonal firm supply.
Column (10) - Includes storage withdrawal volumes from Columbia Gas Transmission and Texas Gas NNS.

FORM FG2-4: EXISTING AND PROPOSED STORAGE FACILITIES (In MMCF)

COMPANY NAME: DUKE ENERGY OHIO

		Capacity			
Reservoir Name (Percent Ownership)	Location	Cushion (Base) Gas	Working (Top) Gas	Total	Completion Date

Note: Duke Energy Ohio neither owns, nor is currently proposing to construct any storage facilities.

FORM FG2-5: EXISTING AND PROPOSED PROPANE FACILITIES (In Gallons)

COMPANY NAME: DUKE ENERGY OHIO

Facility Name	Location	Capacity	Completion Date
Eastern Ave. Plant	2817 Eastern Ave. Cincinnati, OH	8,000,000 Gals.	Year: 1946-47 Addition: 1963-64
Dicks Creek Plant (1)	Oxford State Rd. Middletown, OH	0 Gals.	Year: 1959
Erlanger Plant (2)	3000 Crescent Springs Rd. Erlanger, KY	7,000,000 Gals.	Year: 1961

(1) In 2013, Enterprise TE Products Pipeline Company notified Duke Energy Ohio that they were declaring Force Majeure and shutting down the storage cavern that supplied propane to the Dick's Creek Plant. The ultimate disposition of the Dick's Creek plant has yet to be determined.

(2) Owned by Duke Energy Kentucky, a subsidiary company.

Note: Duke Energy Ohio is currently not proposing to construct additional propane facilities.

FORM FG2-6: OTHER PEAKING FACILITIES

COMPANY NAME: DUKE ENERGY OHIO

Facility Name	Location	Capacity	Completion Date

Note: Duke Energy Ohio neither owns, nor is currently proposing to construct, any peaking facilities other than those identified in Form FG2-4 and Form FG2-5 in this report.