



2008 Integrated Resource Plan

December 15, 2008

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Section 1
Executive Summary

Cascade's resource planning continues to focus on ensuring that the Company can meet the needs of our firm gas sales customers in a way that minimizes costs over the long term. Although some pipeline area zones indicate potential shortfalls, in aggregate, through 2010, Cascade has sufficient upstream pipeline capacity. However, as we move past the 2010-2011 winter heating season, primarily as a result of Cascade's continued growth in its residential and commercial customer base, Cascade's capacity will fall short of its design peak day demand forecast. Therefore, Cascade is entering a period where it will need to acquire additional resources to meet the growing needs of these core customers. The following summarizes key findings from this plan.

Adequacy of Gas Supply

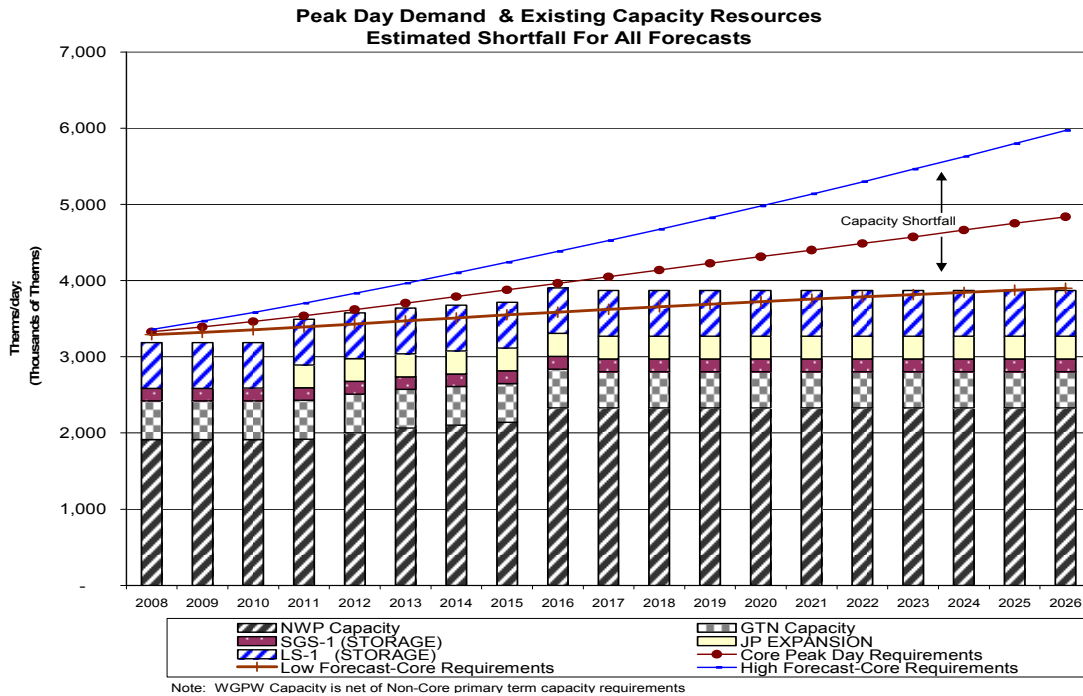
Physical gas supply is expected to be adequate to meet growing demand in the Pacific Northwest and North America, however, at a cost. To meet growing demand for end-use, many industry experts predict imports of liquefied natural gas (LNG) will be needed, and will be developed on a nationwide basis in order to allow supply to keep pace with growing demand. Additionally, new supply development technologies continue to provide additional resources in British Columbia and the Rocky Mountain regions. Shale gas from the Horn River Basin and new finds such as the Pierre Shale in the Rockies are likely to keep sufficient supplies available in North America through 2012. Still, due to on-going financial and regulatory issues, there is still some question as to whether or not a new pipeline will transport Alaskan gas into the North American market, or if it will be completed within the Company's planning period. It should be noted that most independent forecasts (such as that developed by the Energy Information Agency (EIA)) assume that an Alaskan pipeline will be completed between 2017 and 2021. While there appears to be sufficient supply to meet the nation's and northwest's growing needs, long-term gas prices are expected to remain high as well as volatile for the foreseeable future. Higher prices provide the financial incentive for development of new sources in North America along with the importation of LNG.

Load Resource Balance

During this planning cycle, Cascade examined the impacts on both its load and resources and portfolio costs associated with its peak day planning criteria. Cascade has historically utilized a system average of 65 heating degree days (dd) for its peak demand forecast as it represented the coldest day recorded in Cascades' 60 plus years of weather history. Since the Company has only experienced a 65dd once in its history (which occurred in 1968), in this planning cycle the Company modified its design day criteria to utilize the coldest day during the past 30 years. This modification reduced the peak day to 61dd which occurred as recently as 1990.

The following graph shows the peak day requirements compared to the Company's existing pipeline capacity resources under the various load growth forecasts. Shortfalls in the 2009/2010 period will be met through citygate peaking resources.

Figure 1-A



Analytical Methods

Cascade continues to utilize the SENDOUT model to assist with the analysis of resource alternatives. SENDOUT is a linear optimization model that helps identify the long-term least cost combination of resources to meet stated loads. The model determines the optimal portfolio of resources that will minimize costs over the planning horizon based on a set of assumptions regarding resource alternatives, resource costs, demand growth and gas prices. Linear optimization models, such as SENDOUT, are basically deterministic. In other words, they solve the “least cost problem” based upon the assumptions provided to the model. As a result, the Company, beginning with its 2007 IRP, expanded its uncertainty analysis through the purchase of VectorGas (an add-on product) that facilitated the ability to model gas price and load (driven by weather) uncertainty. The monte-carlo functionality was integrated in SENDOUT Version 12.5, which is the platform that Cascade prepared its integration analysis. The monte-carlo modeling capability provides additional information to decision-makers under conditions of uncertainty. The monte-carlo analysis was used in this plan to test the physical and financial risks associated with the optimal portfolio from the basecase planning scenario. This tool provides a valuable enhancement to the robustness of the Company’s resource planning.

Generic Resources

One of the purposes of Integrated Resource Planning is to identify an illustrative resource portfolio to help guide specific resource acquisitions. In this planning cycle, the Company considered a host of resource alternatives that can be added to its resource portfolio,

including additional conservation programs, incremental off-system storage alternatives at MIST and AECO, additional transportation capacity on both Williams and GTN pipeline systems, several of the proposed pipelines to move Rockies gas to the northwest, along with on-system satellite LNG facilities, biogas, and imported LNG. Typically, utility infrastructure projects are “lumpy”, since demand grows annually at a small percentage rate, while capacity is typically added on a project-by-project basis. Utilities often have surplus capacity and must “grow into” their new pipeline capacity, because it is more cost effective for pipelines to build for several years’ worth of load growth at one time than to make small additions each year. However, the Company can minimize the impacts through the acquisition of citygate peaking resources which include both the supplies and the associated pipeline delivery for a certain number of days or through the purchase of other’s excess capacity through short or medium term capacity releases.

Analytical Framework

Traditional integrated resource planning would include analyses targeted at identifying the optimal long-term resource portfolio to meet the demand of the gas utility’s customers across a few customer growth and gas price scenarios. In this plan, Cascade’s resource analysis includes 8 different scenarios that focus solely on gas utility operations. In addition to scenario analysis, Cascade performed two different kinds of Monte-Carlo analysis to examine a variety of risks as noted above.

Summary of Key Findings

- Cascade anticipates its core customer base will continue to grow over the planning horizon in the range of 1.37% to 3.67% per year and annual throughput is anticipated to increase between .89% to 3.19% per year.
- The basecase results indicate energy efficiency programs with a levelized cost of 76 cents per therm or less are cost-effective over the planning horizon, with the price uncertainty analysis indicating that the levelized costs will likely range between 69 to 85 cents per therm. However, if carbon legislation is established by 2010 similar to that described in Section 5, the cost-effectiveness limits could increase between 28 to 46 cents depending upon the level of the costs and the timing of the implementation. As discussed in Section 5, Cascade uses a levelized cost of 85 cents per therm in its conservation analysis, which the company believes is still appropriate in light of the uncertainties surrounding carbon legislation over the planning horizon. Although some measures in the conservation stack may exceed the cost-effectiveness threshold, the overall conservation program will remain cost-effective.
- As describe in Section 5, the conservation potential analyses indicates that the over the 20 year planning horizon the technical potential associated with cost effective conservation measures is 24,713,891 therms in Oregon and 82,267,102 therms in Washington for a combined total of 82,267,102 therms.

- Even with energy efficiency programs, Cascade will need to acquire additional capacity resources to meet anticipated peak day requirements, primarily due to continued growth in the company's residential and commercial customer base. It appears that the Sunstone and Blue Bridge project(s) are the best solution for addressing Cascade's growing peak day needs. Sunstone will allow Cascade to move additional supplies from the Rockies to address the capacity shortfalls and also provides additional supply diversity to Cascade's Oregon customers who have been traditionally served for the most part with natural gas from Alberta. Additionally, Sunstone combined with Blue Bridge pipeline provides the means to bring Rockies supplies to the I-5 corridor.
- Many of the proposed pipeline projects, such as Sunstone and Blue Bridge will not be an available resource for a few years. In the interim, capacity shortfalls will be met through the use of peaking and citygate gas supply deliveries which will utilize third-party (non-Cascade) upstream pipeline transportation.
- Both Bio-gas projects and Satellite LNG facilities that are located within Cascade's distribution system may also be attractive alternatives. They may alleviate the need for incremental pipeline capacity and to the extent the facility could be strategically located on a portion of the distribution system they could provide the further benefit of eliminating or reducing distribution system constraints. Prior to any Bio-gas supplies being added to the portfolio, gas quality issues will need to be satisfactorily addressed. In addition to Cascade, upstream pipelines, such as Northwest Pipeline are already beginning to address gas quality issues regarding bio-gas. Based on current market information, the model begins to bring a small level of bio-gas into some of the farming areas (such as Zones 10 and 11) starting in Spring 2012.
- None of the proposed LNG projects are within Cascade's distribution system. Many of the proposed LNG import facilities located in the Pacific Northwest (Bradwood Landing, Jordan Cove) would require backhaul capability or additional infrastructure on upstream pipelines in order to reach Cascade's distribution system. However, beginning with the 2012-2013 heating season, the Kitimat project located in Northwest British Columbia is the most attractive option for Cascade as the company could use its existing Westcoast system transport agreements to move the supplies to Cascades service territory. LNG supplies sourced at Kitimat were selected as part of the least cost-portfolio mix, however, on September 19, 2008, Kitimat LNG announced that the development focus of the facility would switch from a regasification to a liquefaction facility, making Kitimat an exporter, rather than an importer of natural gas. Kitimat did leave open the possibility of providing regasification in addition to liquefaction. The company did analyze the other two LNG options in the Northwest (Bradwood and Jordan Cove) along with the incremental pipeline capacity that would be necessary to reach Cascade's service territory and found that based on preliminary cost estimates that model preferred the Rockies expansion projects over the import LNG options. The company will

continue to monitor the impact various imported LNG options and update its modeling assumptions as more information becomes available.

- 20 year portfolio costs, on a Net Present Value (NPV) basis, are expected to range between \$3,309,990,000 to \$3,492,950,000 for the planning period, with an average cost per therm ranging between \$.4544 and \$.4662.

Use and Relevance of the Integrated Resource Plan

Cascade's Integrated Resource Plan provides the strategic direction guiding the Company's long-term resource acquisition process. The plan does not commit Cascade to the acquisition of a specific resource type or facility, nor does it preclude the Company from pursuing a particular resource or technology. Rather, the plan identifies key factors related to resource decisions and provides a method for evaluating resources in terms of their cost and risk. Cascade recognizes that integrated resource planning is a dynamic process reflecting changing market forces and a changing regulatory environment.

Section 2

Introduction and Planning Overview

Company/Service Area Profile - Customers, Resource Maps

Beginning in 1953, Cascade Natural Gas Corporation began acquiring small local gas distribution companies in anticipation of the construction of an interstate pipeline to bring natural gas into the Pacific Northwest in 1956. The pipeline began in New Mexico and moved northwesterly into the northeast corner of Oregon and on into Washington, to the Canadian border near Sumas, Washington. Cascade's distribution system tapped into the pipeline at many places in Oregon and Washington. Usually, an industrial operation located in the area made it economically feasible for Cascade to construct its initial distribution system to serve the industrial customer and then branch out from there to serve the residential and commercial communities in the nearby area.

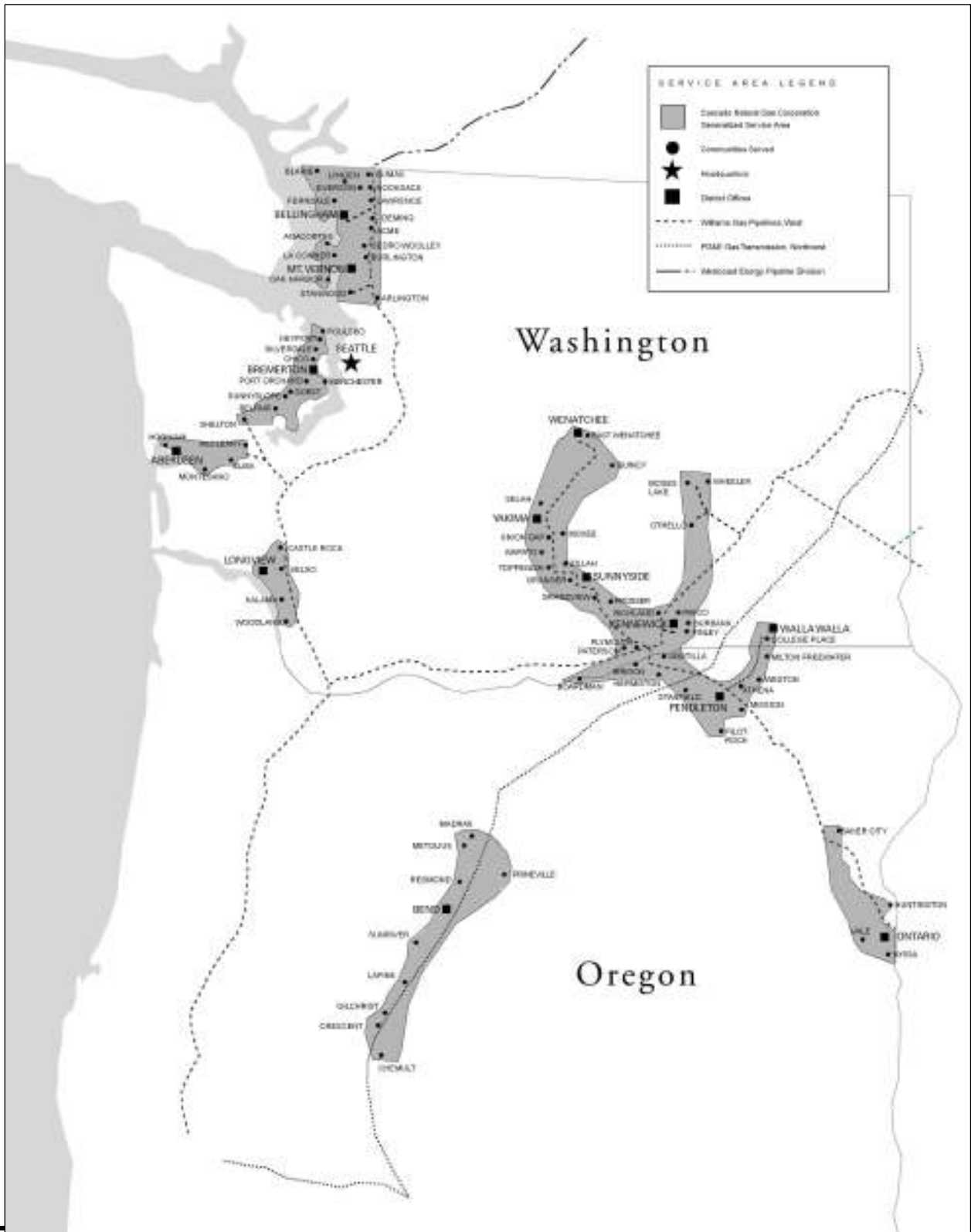
Today, Cascade's service territory covers about 32,000 square miles and extends over 700 highway miles from end to end, encompassing a richly diverse economic base as well as varying climatological areas (see service area map, Figure 2-A). Cascade serves over 90 communities throughout Washington and Oregon consisting of about 250,000 customers. All of the communities Cascade serves are small cities and towns. This makes Cascade unique in the gas distribution business in the Pacific Northwest. Cascade's customer base currently includes approximately 217,000 residential customers, 32,000 commercial customers, and 700 industrial customers. Cascade's sales volumes reflect the ratio of approximately 75% in Washington and 25% in Oregon.

Bundled vs Unbundled Service

Since Cascade began distributing natural gas in the Pacific Northwest, the Company has offered its customers a "bundled" natural gas distribution service. This bundled service included purchasing the gas supply, transporting that supply to Cascade's city gate, and distributing that transported supply to each Cascade customer through the Company's local distribution system. Customers receiving traditional bundled services are referred to as core customers. In 1989, Cascade "unbundled" its rates and as a result approximately 200 of the 700 industrial customers have elected to become "non-core" customers. These customers have made the choice to rely on alternative methods of service rather than the traditional bundled gas supply and pipeline transportation services available to core customers for their gas requirements. Therefore, providing gas supply and transportation capacity resources to non-core customers is not considered part of this Integrated Resource Plan as such resources are separate from the supply and capacity contracts for the core customers who continue to utilize Cascade's bundled system gas supplies and capacity. Although the resource needs for non-core customers are not included in either the conservation or supply side resource analysis, their contracted peak day delivery is considered in the distribution system planning analysis discussed in Section 4.

For the Calendar year ended December 2007, Cascade's 217,000 residential customers represented approximately 13% of the total natural gas delivered on Cascade's system, while the 32,000 commercial customers represented approximately 10% and the 500 core market industrial customers consumed approximately 2% of total gas throughput.

FIGURE 2-A



The remaining 200 non-core industrial customers represented about 74% of total throughput.

Cascade purchases natural gas from a variety of suppliers and transports gas supplies to its distribution system via two natural gas pipeline companies. Williams' Northwest Pipeline GP (NWP) provides access to British Columbia and domestic Rocky Mountain gas while the Gas Transmission Northwest (GTN) provides access to Alberta gas. Cascade also holds transportation contracts upstream of these systems on TransCanada Pipeline's Foothills Pipeline (formerly ANG) and Alberta Systems (also known as NOVA), as well on Westcoast Energy, Inc. (Spectra Energy).

IRP Guidelines and Policies

Cascade utilizes integrated resource planning to maximize the efficiencies of the Company's utility operations. The planning process includes an assessment of current and future gas load requirements, the possible resource options for serving the projected load requirements, and a selection of the set of least cost resource alternatives with acceptable level of reliability through the use of an optimization model. Monte-Carlo simulation tools are utilized to further analyze the results of the optimization model to quantify the range of uncertainty in market price and demand due to changes in weather.

Cascade is subject to regulatory oversight by the Washington Utilities and Transportation Commission (WUTC) and the Oregon Public Utility Commission (OPUC). Each commission has established a set of guidelines or rules, which the company's plan must meet. In Washington those guidelines are contained in WAC 480-90-238, in Oregon the guidelines are found in the Commission Order No. 07-002 in docket UM 1056. In general, both commission guidelines require that the utility develop a range of demand forecasts, examine all feasible resources for meeting that demand whether they are supply-side or demand side and compare them on an equal basis, considering uncertainty over the planning horizon, develop a 2 year action plan and involve the public and the various stakeholders in the planning process.

Cascade believes that its IRP meets the substantive requirements of both the Washington and Oregon Commissions. This IRP includes a range of demand forecasts that encompass the anticipated forces, both economic and weather-driven, that will impact the load forecasts over the planning horizon. The demand side resource section includes an assessment of technically feasible improvements in the efficient use of natural gas. The supply resource section includes a discussion of the supply side resource options available including an assessment of conventional and commercially available nonconventional gas supplies, an assessment of opportunities for additional company-owned and contracted storage, and an assessment of the Company's existing pipeline transportation capability and reliability along with the opportunity for incremental pipeline transportation resources. The integration section provides a comparative evaluation of the cost of the various resource options on a consistent and comparable method. The resource integration section also describes the integration of the demand forecast and resource evaluations into a long range resource plan describing the

strategies designed to reliably meet current and future needs at the lowest reasonable cost to Cascade's ratepayers. The short-term action plan describes the specific actions the utility will take to implement the long-range integrated resource plan during the next two years and reports on the Company's progress in meeting its prior 2-year action plan goals.

Cascade believes all resources described in this IRP have been evaluated on a consistent and comparable basis through the use of its optimization model. Uncertainty has been considered in each component of this plan. The demand forecast includes a reasonable range of uncertainty as quantified in the low, medium and high load growth scenarios along with the additional simulation analysis calculated through Sendout's monte-carlo functionality that assesses the impacts of weather on the load forecasts. The demand side and supply side resource sections describe relative uncertainties regarding reliability, cost and operating constraints and external costs. Uncertainties associated with the environmental effects of carbon emissions have also been included through an analysis of the impact of carbon legislation on the portfolio. Price volatility and market risks and their impacts on the Company's long-term resource portfolio have been assessed through the use of the Sendout model.

To involve public interests in the development stages of this IRP, Cascade has a Technical Advisory Group (TAG). Three meetings were held to discuss the major IRP topics including the demand forecast, distribution system planning, demand side resources, supply side resources, and resource integration and uncertainty analysis. A fourth meeting was held after filing the Draft Plan to review the plan and receive preliminary comments. The TAG meetings were helpful to Cascade as questions were answered and varying points of view were explored. Appendix A-2 contains an outline of the meeting content and a list of participants. Additionally, customers and interested parties were invited to comment on Cascade's Draft 2008 IRP. As a result of the comments, prior to filing the final text, Cascade made modifications to its Plan to address many of the comments received. Where the recommendations were not specifically addressed, the company incorporated them into the 2-year Action Plan. Copies of the comments are included in Appendix A-4.

Appendix A-3 provides additional information regarding the specific requirements or guidelines for each commission and how the company has met those requirements.

Resource Decision Making Process Overview

Cascade makes resource decisions based on the best quantitative and qualitative information available. The IRP tools that are continually evolving assist Cascade in formulating energy resource decisions in a logical, consistent and comparable manner. The steps outlined below are those utilized by Cascade for both its short-term and long-term resource decisions.

1. Construct a range of possible demand forecasts for the core market.

2. Calculate avoidable distribution system enhancement costs.
3. Provide the optimization model the existing supply side and demand side resource options to meet demand.
4. Run the optimization model to identify resource needs including the types of resources and their timing requirements. The existing portfolio is modeled under a range of demand forecast conditions.
5. Identify incremental supply and demand side resources to satisfy a range of incremental growth scenarios.
6. Run the optimization and Monte-Carlo simulation models to identify the best-fit portfolio given an expected range of forecasted core loads and operating conditions.

The resource decision-making process is dynamic and ongoing and the Company's resource strategy must constantly evolve to reflect dynamic market forces and a continually changing regulatory environment. This IRP document represents a snapshot in time similar to a balance sheet. It is not meant to be a prescription for all future energy resource decisions as conditions will change over the planning horizon and will impact areas covered by this IRP. Rather, this document is meant to describe the currently anticipated conditions over the long-term planning horizon, the anticipated resource selections and most importantly the process for making resource decisions.

Disclaimer –Important notice

Cascade makes the following cautionary statements in its Integrated Resource Plan and appendices to make applicable and to take advantage of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 for any forward-looking statements made by or on behalf of Cascade. This Plan, its appendices, and any amendments or supplements to it, include forward-looking statements, which are statements of expectations, beliefs, plans, objectives, assumptions of future events or performance. Words or phrases such as “anticipates”, “believes”, “estimates”, “expects”, “intends”, “plans”, “predicts”, “projects”, “will likely result”, “will continue” or similar expressions identify forward-looking statements.

Forward-looking statements involve risks and uncertainties, which could cause actual results or outcomes to differ materially from those expressed. Cascade's expectations, beliefs and projections are expressed in good faith and are believed by the Company to have a reasonable basis, however, there can be no assurance that Cascade's expectations, beliefs or projections will be achieved or accomplished.

Any forward-looking statement speaks only as of the date on which such statement is made and except as required by law, Cascade undertakes no obligation to update any

forward-looking statement to reflect events or circumstances after the date on which such statement is made or to reflect the occurrence of unanticipated events. New factors emerge from time to time and it is not possible for management to predict all such factors, nor can it assess the impact of any such factor on the business or the extent to which any factor, or combination of factors, may cause results to differ materially from those contained in any forward-looking statement. These materials and any forward-looking statements within them should not be construed as either projections or predictions or as business, legal, tax, financial, or accounting advice and should not be relied upon for any such purpose.

Section 3
Demand Forecast

Each year, Cascade develops a 20-year forecast of customers, therm sales and peak demand which the company uses for both short-term planning activities, such as the Company's annual budgeting process, along with long-term planning activities such as distribution planning and integrated resource planning.

The demand forecast is Cascade's best estimate of future core market firm energy resource requirements over the 20-year planning horizon. The core market firm demand forecast is a necessary initial step toward defining the level of resources required under a range of anticipated economic, demographic and marketplace conditions. The range of anticipated conditions is encapsulated in the low, medium and high forecasts. The forecasts are used both for determining future system enhancements required for the distribution system as well as utilized in the optimization model for determining the least cost portfolio of supply and demand side resources.

Annual Growth and Use per Customer Forecasts

Cascade utilizes econometric models for developing the core residential, commercial, and industrial forecasts. Econometric models allow the Company to predict the number of customers based on historical relationships of growth in customers and therm usage to economic variables. Forecasts are developed for each of Cascade's 90 towns based on county demographic data since the economic variables used to estimate the model parameters are not consistently available at the town level.

In an effort to increase the level of detail and accuracy over previous year's plans, the forecasts developed for each town are then combined to develop projections on a zonal basis. Given the diverse territory that Cascade serves, modeling by zones allows factors such as weather patterns to be better tailored to the relevant populations. Appendix B-1 provides a table of the towns and districts that compose each zone utilized in the model. Forecasted customer growth and use per customer growth for specific zones are provided in Appendix B-2.

Cascade utilizes two models per customer sector to develop the annual load forecast; one to forecast the number of customers in the particular sector, and the second to forecast the annual usage per customer. The results of the customer growth forecast and the usage per customer forecasts are combined to calculate the annual load projections for each customer class.

The economic variables used to forecast residential customer growth are population, employment and housing market conditions, (as measured by 30 year mortgage rates). Both the commercial and industrial customer growth forecasts are based on population, employment and prime interest rates. Cascade continues to use Woods & Poole Economics as the data source for much of the economic figures, primarily because it provides economic data at the county level for all of Cascade's service territory. For this plan, the Company has used the 2007 State Profile which contains county level data for the 1969 through 2028 time period. The Woods & Poole State Profile provides population, number of households, personal income and employment figures used in

developing the medium growth scenario. In order to develop the high and low growth forecasts, variants were applied to the Woods and Poole data in order to develop a range of economic statistics. The escalation rate assumptions are provided in Appendix B-1. The 30-year mortgage rate and prime interest rate forecasts assumptions are based on applying the long-term Treasury bond growth rate from the Northwest Power and Conservation Council's Fifth Power Plan to recent interest rate data.

The annual use per customer forecasts are based on heating degree days, natural gas prices and real personal income, with heating degree days and income being the primary drivers. When developing the annual load forecast, the Company utilizes the 20-year average heating degree days for its base forecasts and therefore use per customer forecasts included in the low, medium, and high forecasts estimate customer use under normal weather conditions. In order to determine the impact of weather on the demand forecast, the company has utilized the Monte-Carlo simulation functionality contained in SENDOUT which is discussed in detail in Section 7. As mentioned previously, each town is subject to the weather patterns of their respective zone, and therefore the impact of changes in weather is now being analyzed on a regional basis, as opposed the higher level analysis performed in the previous plan.

To estimate Cascade's retail rates for the planning horizon, the Company applied real gas price escalation rates to the company's then current retail rates (rates that were effective in April 2008). Real gas price escalation rates are based on the Northwest Power and Conservation Council's (NPCC) fuel price forecast from their Fifth Power Plan issued in 2008 NPCC's plan provides escalation factors under a number of growth assumptions and the Company utilized the council's medium growth forecast for its medium load forecast.

Peak Day Forecast

In addition to forecasting number of customers and therm usage on an annual basis, the Company also forecasts peak day usage. The peak day forecast information is utilized for both distribution system planning and peak capacity planning requirements. Cascade must be able to ensure reliable natural gas service to meet its core customers' requirements on a peak day. Cascade believes it has a fundamental responsibility to provide firm service to those customers who pay for and expect gas under all but force majeure conditions. This is especially true for our space-heating customers, primarily residential and commercial customers, who have limited or no alternative heating source. For this reason, Cascade has historically developed its peak day forecast based on a 65 degree day (0 degrees Fahrenheit average temperature) for design weather conditions which represented the coldest day recorded in Cascade's 60 plus years of weather history. However, for this plan, Cascade has modified its design day criteria to utilize the coldest day during the past 30 years. This modification has reduced the peak day to 61 degree days which most recently occurred on December 21, 1990.

The coincident peak day demand forecast was developed from regional weather and purchase point (citygate) therm consumption data observed on January 5, 2004. The gas

use on this date represents Cascade's best peak day demand approximation in recent history. The average temperature on this date produced a system wide 56 degree day. The consumption was then adjusted to reflect estimated consumption during a system wide 65 degree day.

Peak day therm consumption was developed for each town based on the respective regional weather data and weighted average peak day therm consumption. The peak day usage was then escalated each year by the annual therm consumption growth rate. Utilizing the annual therm growth rate assumes that the core market load shape does not significantly change throughout the planning horizon.

Forecast Results

Appendix B-2 contains the detailed results of the low, medium and high growth demand forecasts. The following table provides the system wide annual growth rates for the 20-year planning horizon for customers, annual therm demand, daily baseload, and peak day therm demand.

DEMAND FORECAST HIGHLIGHTS COMPOUND ANNUAL GROWTH RATES 2009 - 2028 HEATING SEASON PLANNING HORIZON				
SYSTEM				
FORECAST	CUSTOMERS	TOTAL ANNUAL THERMS	BASELOAD THERMS	PEAK DAY THERMS
High	3.67%	3.19%	3.25%	3.22%
Medium	2.39%	1.91%	2.11%	2.08%
Low	1.37%	0.89%	0.95%	0.92%

Based on the results of the medium growth demand forecast, Cascade's annual firm core market demand for 2009 is expected to be 301,417,972 therms. By the end of 2028, annual core market demand is forecasted to be 431,783,892 therms. This represents an increase of 43.3 percent over the 20 year planning period and an average annual growth rate of 1.88 percent. Peak day demand requirements for 2009 are estimated at 3,391,606 therms. Peak day requirements are forecasted to increase to 5,013,259 therms by 2028. This represents an increase of 47.8 percent over the 20 year planning period and an average annual growth rate of 1.97 percent.

Residential customers represent 87 percent of Cascade's customers and about 53 percent of core market therm sales volumes. Residential customers are expected to increase from 223,131 for the 2009 heating season to 364,724 in the 2028 heating season under the medium growth scenario. Commercial and industrial customers represent 13 percent of Cascade's customers and about 45 percent of core market therm sales volumes. Commercial customers are forecasted to increase from 33,381 for the 2009 heating season to 46,328 in the 2028 heating season under the medium growth scenario. Figure 3-1 shows the anticipated growth in customers over the planning horizon, and Figure 3-2 depicts the most likely anticipated growth in each class of customer.

Figure 3-1

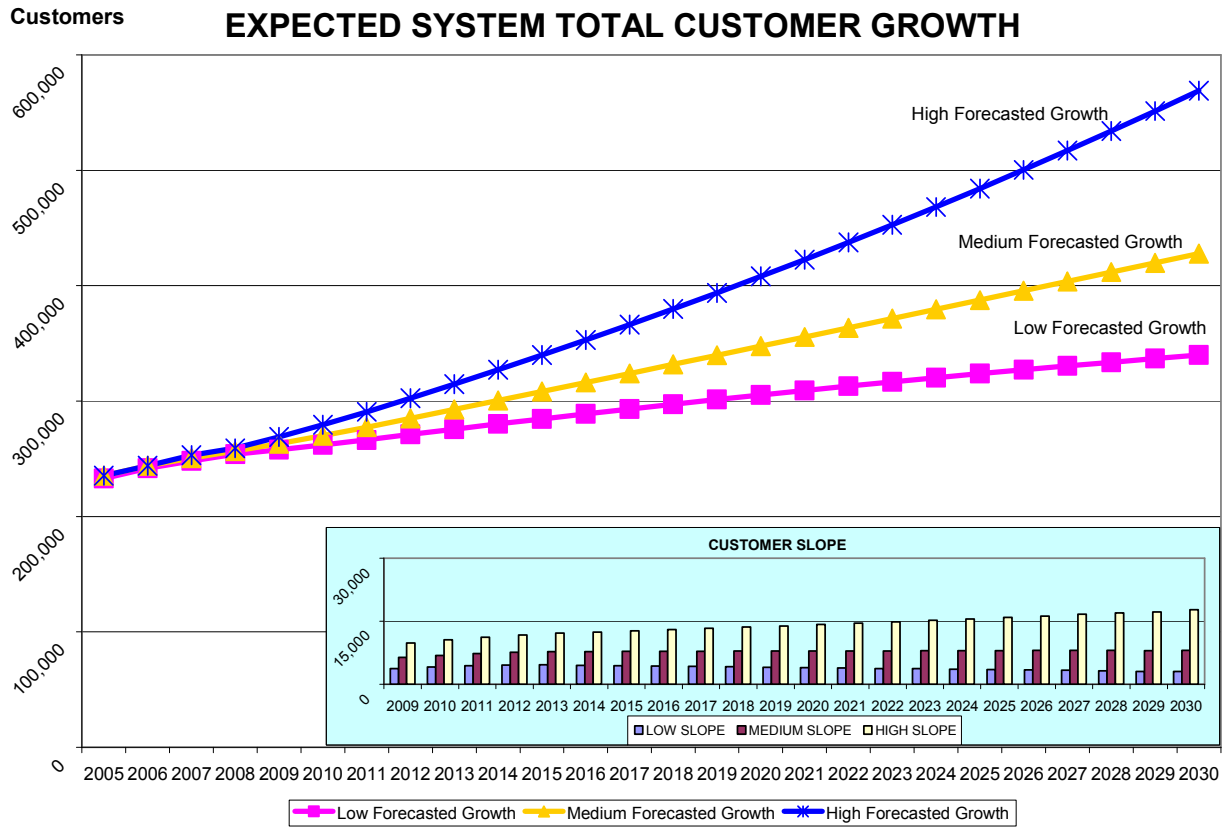
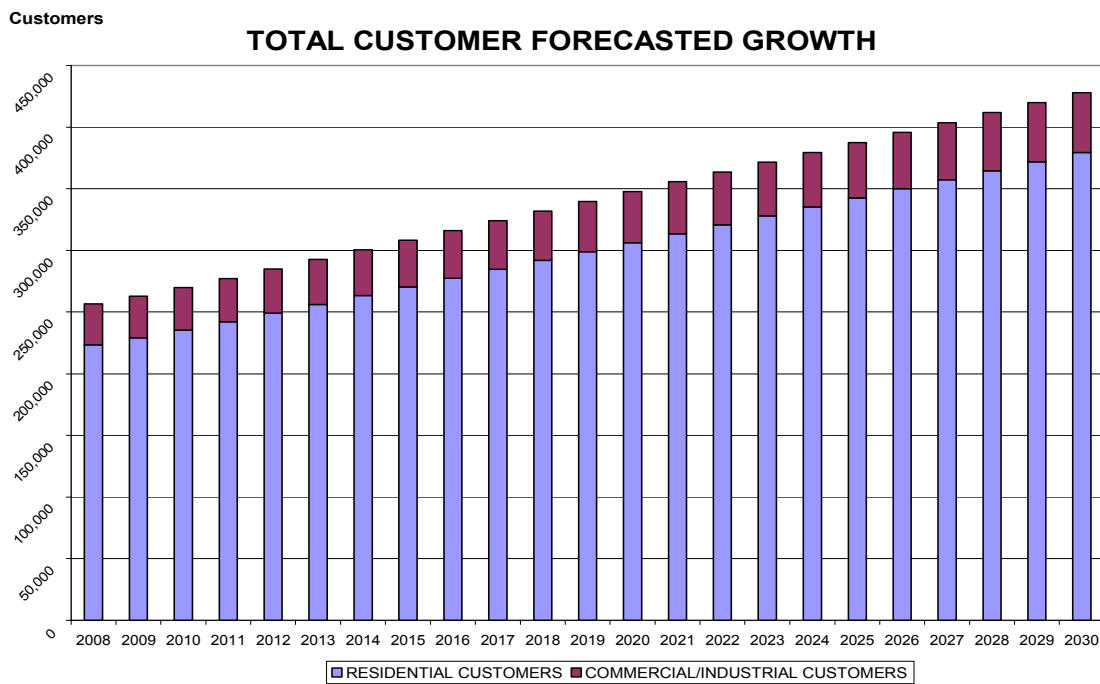


Figure 3-2



Given the extraneous economic circumstances surrounding this forecast, it should be noted that the Low Forecasted Growth scenario is intended to capture expected effects of recessionary activity on Cascade’s demand. In the face of an increasingly likely recession or extended economic slow down, Cascade estimates a meager compounded annual growth rate of 1.37 percent over the planning horizon.

Figures 3-3 and 3-4 show the relative range of expected annual and peak day therm consumption over the planning horizon. Although the overall forecast increases over the planning horizon, the rate of increase slows down due to declining usage on a per customer basis. This trend of decreasing therms per customer makes intuitive sense for the future as new customers make further investments in conservation, building codes are enhanced and customers replace old gas equipment with new higher efficiency gas appliances. Attesting to such circumstances, Cascade has modified the forecast for the Oregon service territory to reflect recent changes in building code standards in that state, which increase the efficiency of newly constructed buildings and gas equipment. It should be noted this baseline forecast does not include the impacts of incremental utility sponsored conservation programs that will be discussed later in this document. Additionally, Appendix B-2 contains additional forecast details including forecasted growth on a zonal and state basis.

Figure 3-3

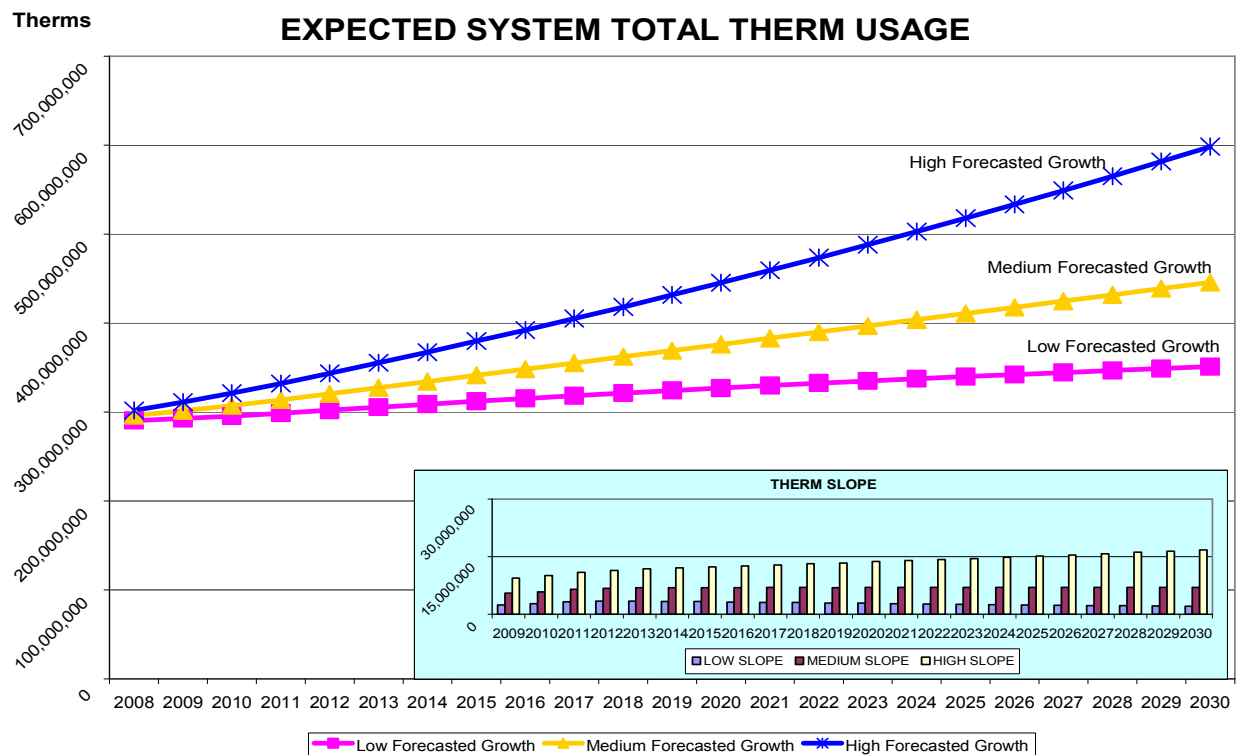
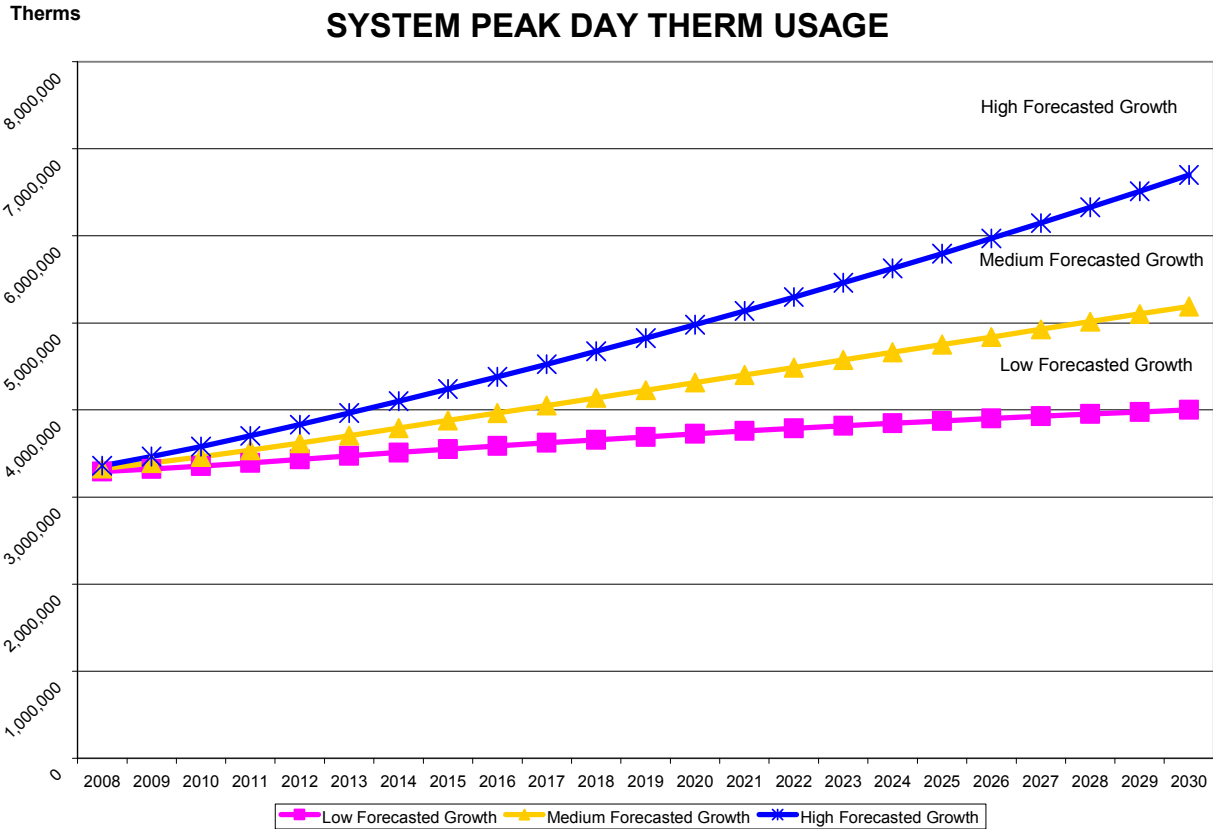


Figure 3-4



The Company regularly monitors the results of its demand forecast models rather than monitoring the forecast assumptions and their relationship to customers and usage estimates utilized by the econometric models. Based on this analysis, the Company believes its forecast is reasonable.

Demand Forecast Uncertainties

Cascade considered planning uncertainty in developing its demand forecast requirements and integrated resource portfolio strategies by developing a wide range of potential scenarios that reflect uncertainty in various sectors. By creating a high, medium and low set of scenarios, the Company has set a range of possibilities for demand to occur. Additionally, as will be discussed in Section 7, the Company has analyzed the impact of weather on the medium growth forecast through the use of Monte-Carlo analysis. This analysis allows the Company to provide an expected range of annual load for the planning horizon that reflects the variations in weather likely to occur throughout the planning horizon.

That said, Cascade believes the potential building code changes in Washington and Oregon are worth specific mention as uncertainties. Given the impact such legislation has upon future customer therm usage, further upgrades to residential and commercial

building codes could dramatically reduce Cascade's load even if customer counts do not decline. Although forecasting and timing such measures is extremely difficult, once building codes are established Cascade is capable of modeling this decline in customer usage (as is the case with the recent code changes in Oregon). Future code changes, however, are unknown.

Another specific uncertainty that could significantly impact this forecast is the increased push toward "Direct Use" campaigns. If "Direct Use" is strongly emphasized and sees even moderate success, Cascade's customer base and core demand would increase. Such campaigns are largely out of the Company's control, and so are under close scrutiny given the considerable effect it may have on this forecast.

With respect to customer reactions to Cascade's retail rate increases/decreases, historical observation has shown that noticeably negative therm usage is only recorded for a short period following rate increases. In the same way, rate decreases bring about noticeably positive therm usage, but again for only a limited time. As such, Cascade has not included a factor for price elasticity directly into this year's forecast model given the "revision to mean" nature of previous rate increases and decreases coupled with the strong influence of weather patterns in the Pacific Northwest. Additionally, gas costs have proven to be a more significant driver in forecasting the effects of Demand Side Resources, which are ultimately removed from the gross numbers produced by the Demand Forecast. However, Cascade plans to further research price elasticity effects within its territories and possibly incorporate any significant results in the next demand forecast model.

Other uncertainties such as significant economic, political, environmental, demographic and regulatory events that could have an effect on natural gas demand in Cascade's service area represent uncertainties that cannot be reasonably quantified in this forecast. As the forecast is refined in subsequent years, many of these uncertainties will become more quantifiable and either implicitly or explicitly incorporated at that time.

Section 4

Distribution System Enhancements

Forecasting by town allows Cascade to estimate the need for distribution system enhancements with a reasonable level of accuracy in the near term of the planning horizon. A localized forecast approach also allows a non-coincidental peak forecast to be developed which is necessary when estimating distribution system enhancement needs. Gas supply and pipeline transportation become secondary issues if the distribution system is constrained. An important part of the planning process is to determine potential areas of distribution system constraints, analyze possible solutions, and estimate costs for eliminating constraints.

Distribution System Modeling

Gas distribution networks rely on pressure differentials to move gas from one place to another. If the pressure is exactly the same on both ends of a pipe, the gas will not flow. Therefore, it is important that gas engineers design the distribution network such that the pressure in the pipe will always be high enough that a differential can be created when gas leaves the system. As gas flow increases, pressure is lost due to friction. Using the laws of fluid mechanics, engineers determine the maximum flow of gas through a pipe of a certain diameter and length that will not cause pressure drops that are too great. This process is known as "gas distribution system modeling".

The modeling process is important because it lets the engineer determine how much flow can be delivered at various places on the distribution system. For instance, when large customers are added to a distribution network, the engineer must determine if the network capacity is large enough to provide the additional flow needed to fulfill customer requirements. Modeling is also important when planning new distribution systems. The correct size main distribution pipes must be installed to allow for the flow needed to meet the requirements of current customers, and reasonably anticipated future customers at reasonable costs.

It is desirable to know if an existing distribution system has enough capacity to satisfy new loads due to increasing numbers of customers in the future. The model can also be used to simulate increasing the gas flows through the existing pipes until the pressure loss in the pipes becomes unacceptable.

Engineering Modeling by Town

Utilizing computer software, individual models were created for each of Cascade's different systems. These models include both high-pressure lines and distribution system networks. As gas loads are simulated to increase according to the load forecasts, the pressures within each system are checked. When the simulation shows the pressure dropping to an unacceptable level, that system and the surrounding area is determined to be a constraint area. When constraint areas are found, the analyst determines the most effective way of solving the problem. The solutions sometimes entail increasing the pressure in the system. However, in most situations where future constraint areas are identified, some amount of looping is also needed. The costs for the loops are determined based on system wide averages of past system reinforcements and extensions projects. The average cost per foot is established for

each area, and then the most cost-effective alternative to solving the pressure problem is found. After these costs are tabulated, potential reductions of demand within constraint areas due to conservation will be included in the analysis to determine whether any of the costs can be avoided or delayed.

The modeling output is compared to and, where appropriate, supplemented with data from local field personnel to provide forecasts by town. This allows the analyst to specifically determine, town by town, what reinforcement would be necessary to each system for each year. These town by town costs are then grouped together by gate station.

Key Findings

The results of the distribution system analysis are shown in Table 4-1. The table shows the estimated costs of distribution system enhancements necessary to eliminate constraint areas over the 20 year planning horizon. Appendix C contains further information regarding the possible solutions to alleviate the distribution system constraints. It should be noted that the proposed solutions are preliminary estimates of reinforcement solutions and actual solutions may be different due to differences in actual growth patterns and/ or construction conditions from those assumed in the initial modeling.

These results were based on the best information available and included both the anticipated load growth for the core market from the medium demand forecast along with the contracted peak delivery for each of the non-core customers.

Equally important is to review the impacts of proposed conservation resources on anticipated distribution constraints. Although the Company historically provides utility sponsored conservation programs throughout a particular jurisdiction (i.e. all of Washington or all of Oregon), there may be instances where a more targeted approach could reduce or delay the estimated reinforcement for a specific area. However, as will be discussed in section 5, the acquisition of conservation resources is entirely dependent upon the individual consumers' day-to-day purchasing and behavior decisions. Although the utility attempts to influence these decisions through its conservation programs, the consumer is still the ultimate decision maker regarding the purchase of a conservation measure. Therefore, the Company does not anticipate that the peak day load reductions resulting from incremental conservation will be adequate enough to eliminate distribution system constraint areas at this time. However, over the longer term, (the 2011 through 2025 timeframe) the opportunity for targeted conservation programs to provide a cumulative benefit that offsets potential constraint areas may be an effective strategy.

Table 4-1

\$2008

Gate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025	2027	Grand Total
Arlington	\$370,597			\$118,826			\$1,400		\$65,579	\$31,973	\$233,852	\$186,086		\$35,018					\$1,043,330
Bellingham I		\$40,000			\$349,192					\$34,800			\$149,616						\$573,608
Bend	\$1,053,775	\$2,671,000		\$1,699,000	\$1,057,000	\$710,200		\$128,915		\$29,145		\$67,260	\$43,283			\$113,782		\$51,765	\$7,511,343
Burbank Heights	\$145,730		\$373,293							\$62,776									\$695,581
East Stanwood	\$182,954																		\$182,954
Grandview	\$44,840																		\$44,840
Hermiston	\$90,480			\$61,553		\$30,450							\$5,425						\$187,908
Kalama								\$41,978											\$41,978
Kennewick			\$886,500	\$34,800	\$12,615	\$37,845	\$45,240												\$1,017,000
McCleary				\$1,488				\$113,782					\$36,105		\$56,333	\$25,448			\$151,374
Mount Vernon									\$20,880										\$102,660
Moxee			\$3,588																\$3,588
Othello						\$97,420													\$97,420
Pendleton	\$120,278																		\$120,278
Prineville	\$117,705																		\$117,705
Redmond	\$75,668	\$46,328		\$134,438		\$81,833	\$113,782				\$44,806			\$35,872	\$208,640	\$39,235			\$696,560
Sedro Woolley		\$218,595	\$81,345	\$35,888	\$209,067			\$141,561					\$12,180	\$45,675	\$121,274				\$910,389
Selah						\$1,138													\$1,138
Shelton	\$4,292,383		\$48,700	\$892,953	\$1,550,000	\$372,011	\$40,000		\$90,000	\$5,580,075			\$205,143	\$60,900	\$215,793				\$13,347,957
Stanfield												\$9,013							\$9,013
Stanwood	\$35,018	\$51,983				\$106,773			\$174,876			\$40,000							\$408,649
Sumas	\$298,493	\$119,843	\$313,642	\$156,962	\$170,000	\$1,003,758	\$364,325	\$369,625	\$81,000	\$234,790	\$60,465	\$938,382	\$41,543	\$153,990	\$32,625				\$4,339,442
Sunnyside						\$1,400													\$1,400
Sunniver	\$306,050			\$43,718															\$349,767
Walla Walla	\$7,178																		\$7,178
Woodland		\$130,474																	\$130,474
Yakima	\$1,815,000	\$1,780,000	\$1,319,500																\$4,914,500
Grand Total	\$8,956,146	\$5,058,221	\$3,089,808	\$3,179,624	\$3,347,873	\$2,442,827	\$564,747	\$795,860	\$146,579	\$679,239	\$5,919,198	\$1,240,741	\$493,294	\$331,455	\$673,899	\$113,782	\$25,448	\$51,765	\$37,110,503

Section 5

Demand Side Resources

Introduction and Overview

Demand Side Management (DSM) resources are generally thought of as conservation measures or actions that result in the reduction of natural gas consumption due to increases in efficiency of energy use or load management. Oregon and Washington Utility Commissions require gas utilities to consider cost-effective DSM resources in their energy portfolio on an equal and comparable basis with supply side resources. In the gas industry, DSM resources are conservation measures that include but are not limited to ceiling, wall and floor insulation, higher efficiency gas appliances, insulated windows and doors, ventilation heat recovery systems and weather stripping to name a few. By prompting customers to change their demand for gas, Cascade can displace the need to purchase additional gas supplies, displace or delay contracting for incremental pipeline capacity and possibly displace or delay the need for reinforcements on the Company's distribution system.

There are two basic types of demand side resources. These are baseload resources and heat sensitive resources. Baseload options are those that displace the need for baseload supply-side resources. They will offset gas supply requirements day in and day out regardless of the weather. Baseload DSM resources include high efficiency water heaters, higher efficiency cooking equipment and horizontal axis washers. Heat sensitive DSM resources are measures whose therm savings increase during cold weather. For example, a high efficiency furnace will lower therm usage in the winter months when the furnace is utilized the most and will provide little if any savings in the summer months when the furnace is rarely used or is turned off. Examples of heat sensitive DSM measures are ceiling/floor/wall insulation measures, high efficiency gas furnaces, and improvements to duct work. These types of measures will offset more of the peaking or seasonal gas supply resources, which are typically more expensive than baseload supplies.

Due to differences in the approach to DSM acquisition between Cascade's Oregon and Washington jurisdictions, each of the states will be addressed individually. In Oregon, the Company has been tasked with evaluating the funding adequacies of its public purpose charges that go to the Energy Trust as well as the Company's own low-income programs. In Washington, Cascade is updating the technically achievable conservation potential in its Washington service territory.

2-Year Action Plan Update

Due to timing of IRP filings, Cascade will report on its progress in achieving its Oregon 2004 Action Plan as well as report on the progress in meeting the Company's 2007 IRP Action which was filed with the WUTC.

Oregon 2-Year Conservation Action Plan Update

Cascade's 2004 IRP was acknowledged by the OPUC in August 2005, which based on the 2 year filing requirement, another plan was not due to be filed until August 2007. In January 2007, the OPUC issued Order 07-002 in docket UM 1056 which established a detailed set of guidelines for IRPs. The new guidelines required an annual update, which

Cascade submitted to the Commission in August 2007, which requested an extension of the next plan until December 2008 to coincide with the Washington bi-annual filing requirements.

In the 2007 update to the OPUC, the company reported on the progress it had made in meeting its 2004 2-year action plan. A complete copy of the 2007 Update is included in Appendix I. In the update the company reported on major changes that had taken place since the development of the 2004 IRP, primarily the outsourcing of its conservation administration and program delivery to the Energy Trust of Oregon which was to be funded through 80% of the Public Purpose Funding with the remaining 20% going to Community Action Agencies to support expanded Weatherization Programs and bill assistances in the Company's Oregon service territory.

Oregon Conservation Programs and the Energy Trust of Oregon

Since July 2006, Cascade has relied on the Energy Trust of Oregon (ETO) for the delivery and administration of its conservation programs in Oregon. As mentioned above, 80% of the public purpose funding is transferred to the ETO to design, promote and administer Natural Gas energy efficiency programs on behalf of Cascade. During 2007, therm savings attributed to Cascade's Oregon service territory amounted to 151,291. Through July 2008, ETO has achieved 49,263 and estimates that 2008 annual therm savings will be approximately 235,660.

Oregon Low Income Weatherization Program

From January 1st through December 31 2007, 24 homes had been weatherized in Oregon with an annual cumulative therm savings of 3,573 with \$33,164 provided in rebates. This figure may not represent the full savings achieved though the program as there is currently no viable therm savings number associated with furnace tune-ups. Moving forward, this figure will be taken directly from an agency's TREAT audit, where provided.

As of September of calendar year 2008, Cascade's Oregon Low Income Weatherization Program has served 41 homes and achieved a savings figure of 5,277 therms with a total expenditure of \$46,497.47. Expended funds reflect only a small portion of the \$293,659.61 still available as of August 30, 2008. This surplus suggests that while program funding is plentiful there may be potential limitations within the Low Income Weatherization Assistance Program (WAP), the current delivery mechanism of our program.

Therefore Cascade is currently working with its Oregon Conservation Advisory Group (CAG) to better understand the capacity of WAP to serve Cascade homes and evaluate strategies designed to increase the level of participation in the program either through modifications to the program measures, incentives, or delivery approach. Such program alternations will be critical as we strive to achieve greater therm savings in the years to come.

Washington 2-Year Conservation Action Plan Update

Cascade’s IRP contained several action items that were to be addressed with the filing of a Conservation & Low Income Weatherization Plan (Conservation Plan). The Conservation plan was initially filed with the WUTC on May 5, 2007. The Conservation Plan was eventually approved on October 1st of the same year after some revisions, primarily the increasing of the original therm targets for the 2008, 2009 and 2010 period. The revised therm savings targets are higher than those originally listed in the 2007 IRP, and detailed below.

**Table 5-1
CONSERVATION AND LOW INCOME WEATHERIZATION PLAN
THERM SAVINGS TARGETS**

YEAR	RES & COMM/IND	LOW INCOME WEATHERIZATION	TOTAL ANNUAL SAVINGS
2008	322,500	13,125	335,625
2009	415,000	26,250	441,250
2010	530,000	35,500	565,500

Cascade’s IRP contained several action items that were to be addressed in the Conservation & Low Income Weatherization Plan, beginning with the modification of the then-current Low-Income Weatherization Program. The Conservation Plan also called for the implementation of additional prescriptive measures for residential customers, implementation of a custom program for commercial/industrial customers; and outsourcing program delivery to third party vendors. In this way, Cascade essentially aimed to establish a mini network of contracted agencies mirroring the business model of the Energy Trust of Oregon. Finally, Cascade’s 2007 IRP Action Plan called for Cascade to monitor the progress of Washington’s Climate Change Challenge and analyze its potential impacts. Each of these areas are described in more detail below

Washington Low Income Weatherization Program Modification

Among the proposed modifications to the Low Income Weatherization programs, the most significant change was to allow for incentives of up to 100% of the cost-effectiveness limit on qualifying measures. During the first 15 months of the original program, the company had seen limited participation in this program with only 10 homes being weatherized. Comments on the program indicated that the lack of participation was primarily due to the original limitation of the rebate to 50% of the cost effectiveness limit, which required the agencies to find other funding sources to bridge the gap between the funding provided by Cascade and the actual costs to weatherize the home. In response to these comments, the Plan was modified to allow up to 100% of the cost effectiveness limit on qualifying energy efficiency measures and the change was implemented on October 1, 2007 in conjunction with the approval of the Conservation Plan.

The program modifications have resulted in a gradual but steady increase in weatherization completions through calendar year 2008 resulting in a total of 27 homes served by September 2008 with a total savings of 8,437 therms. It is anticipated that the

end of the calendar year will yield savings near or within the established target of 13,125 therms.

It should be noted that although 12 agencies are qualified to deliver energy conservation measures in Cascade's service territory 77% (21) of the 27 weatherization jobs delivered by the network to date were delivered by only two agencies. The remaining 23% (6) were delivered by two additional agencies, including one, which only began participating in Cascade's rebate program in July of 2008. This suggests that there are obstacles still remaining before full implementation can be achieved by the weatherization delivery network.

Washington Residential Program Expansion

Cascade's 2007 IRP Action Plan specifically noted the implementation of a prescriptive program in Washington that would incentivize new construction customers to utilize Energy Star insulation and duct standards, as well as a program to encourage residential customers to weatherize their existing homes. The expanded program was implemented on October 1, 2007 upon approval of the Conservation Plan and as a result residential customers are eligible for utility rebates for improved insulation and ducts in both new construction and the retrofit markets.

Washington Commercial/Industrial Programs

Along with the noted residential program improvements, Cascade's 2007 IRP Action Plan listed the implementation of a custom conservation program aimed at the commercial/industrial sector. The addition of the custom program is that it provides incentives to customers installing energy efficiency measures that are cost-effective but do not fit into the existing prescriptive program such as O&M, controls, or other specialty measures. Overtime, if the company continues to receive requests for similar measures, prescriptive programs maybe expanded to include these measures and carved out of the custom program. The custom program is also the best opportunity to reach the small industrial customers who likely would not be eligible to participate in the company's prescriptive measures.

Third Party Program Delivery

Another commitment in both the IRP and the Conservation plan was the outsourcing of the program delivery to a third party vendor in order to improve participation in both the residential and commercial/industrial programs. The company sent out separate RFP's for the Residential and the Commercial/Industrial Programs on October 31, 2007 to 13 vendors based on input from the company's Conservation Advisory Group. Although only 3 vendors responded to the RFP, all three had experience in providing similar programs for other utilities/agencies including the Energy Trust of Oregon.

The company selected Conservation Services Group (CSG) to perform the role of program management contractor (PMC) for the residential conservation program and Lockheed Martin Services, Inc. (LM) was selected as the PMC for the commercial and industrial conservation programs.

Impacts of Washington's Climate Change Challenge

Since Governor Gregoire announced the Executive Order creating Washington's Climate Change Challenge in February 2007, Cascade has monitored the progress of the Challenge as it pertains to the utility. On September 23, 2008 the Western Climate Initiative (WCI) released its Greenhouse Gas Cap and Trade design recommendation. Although the WCI participants, which include both Washington and Oregon, have a certain amount of flexibility in setting requirements for implementation, compliance and enforcement of the program below are some of the key recommendations:

- Reduce GHG emissions to 15% below 2005 levels by 2020
- GHG measurements and monitoring begin 1/1/10 for reporting in early 2011
- First compliance period begins 1/1/12--electric generation (including imports); industrial and commercial combustion; industrial process non-combustion emissions
- Second compliance period begins 1/1/15--residential, commercial, and industrial fuel combustion below 25,000 metric ton threshold; transportation fuel
- No set date for allowance allocations, but they will be established prior to 2012
- Encourage entities to reduce GHG emissions 1/1/08-12/31/11 by issuing Early Reduction Allowances that are in addition to allocated allowances and are treated like allocated allowances

Since many of the specific requirements are still unknown, the company anticipates that new regulations will be determined during 2009 so the 2010 monitoring timeline can be met. During this time period it will be easier to determine how the initiative will impact Cascade and its customers. One possible outcome could be a greater push by electric utilities for "Direct Use" campaigns which would likely increase Cascade's therm load. Depending upon the ultimate legislation, a carbon tax, similar to the one recently enacted in British Columbia is another possible outcome that would result in further increases in natural gas costs to residential, commercial and small industrial customers that may encourage customers to participate in the utility sponsored conservation programs. Another possible outcome would be modifications to the building codes to require higher levels of energy efficiency. If realized, a greater number of energy efficient buildings could capture high percentages of the savings potential outlined in Cascade's conservation potential study, however they would not be attributable to the Company itself.

Potential DSM Measures and Their Costs

The first task in designing any DSM program is to analyze and determine costs and the associated energy savings for conservation measures along with estimating their applicability within Cascade's service territory. Evaluating specific measures involves ranking measures by levelized cost per therm saved. Each measure's cost and estimated therm savings are compared to supply side costs over a 20-year planning horizon. Administration expenses are included only in total program costs, not in measure costs and are expected to vary by program type and duration.

A total resource cost (TRC) approach is used to evaluate the cost-effectiveness of all DSM resources. The TRC method compares total net costs of DSM resources to the total net cost of supply side resources displaced. A program or measure is cost-effective if the present value of energy savings and non-energy benefits derived from installing that measure is greater than the total resource cost (TRC) of the program or measure. Non-energy benefits may include, for example, water savings from low-flow showerheads and higher efficiency clothes washers or reductions in maintenance costs.

During 2006, the company hired Stellar Processes to prepare a study of the technical and achievable conservation potential for Cascade's Washington and Oregon service territories. Stellar Processes, working with Ecotope, provided a similar study to the Energy Trust of Oregon. In 2008, the ETO approached Stellar to update their Oregon study, which provided an opportunity for Cascade to apply the relevant revisions to the Washington study prepared in 2006. It should be noted that, at the time of this writing, Cascade had utilized the most up-to-date draft version of Stellar's study to ETO to update their Washington study and Oregon achievable estimates. Although the study used was still called a draft, Cascade is fairly confident in its findings after working with the ETO to address questions and concerns. In both studies, the goal of the project was to provide Cascade with an estimate of the energy saving measures for the residential, commercial and industrial markets, an estimate of the costs for those measures and even more important, their potential applicability in Cascade's service territory. Below is a description of the process utilized by Stellar to identify the potential savings for each market segment.

Prior to discussing Stellar's process, one must first understand the difference between the "technical" potential energy savings and the "achievable" potential energy savings. The technical potential is the estimate of all energy savings that could be accomplished without the influence of any market barriers such as cost and customer awareness. Therefore, it provides a snapshot of all measures that could be done. Technical potential is a starting point and does not represent what can be saved through programs since it would be impossible to get every customer to install every possible measure. Achievable potential represents a more realistic assessment of expected energy savings since it accounts for some economic constraints. Stellar estimated achievable potential by multiplying technical savings by 85%, a standard established by the Northwest Power and Conservation Council that has historically been used to determine the achievable potential for electric conservation measures. From the resulting achievable potential, the next step is to estimate attainable program ramp-up rates that consider marketing, technology delivery channels, and other program constraints to develop a 20-year DSM deployment scenario with year-by-year achievable savings,

The approach used by Stellar, to develop the technical potential was as follows:

- Quantified the current energy use by sector and customer type.
- Estimated energy consumption by end use for each customer type.
- Applied the forecasted growth rate to estimate the customer base available in future years.

- Reviewed information on specific measures for applicability to Cascade’s Washington customers.

In order to quantify the Energy Use, Stellar utilized the Company’s estimate of sales by customer group and market segment along with estimates of Energy Use Index (EUI energy/sqft) factors to calibrate their estimates to match the utilities actual sales data.

The methods used to estimate energy consumption by end use varied depending upon the customer group. For the residential sector, Stellar applied prototype models in three climate zones to estimate major end use consumption, which was then calibrated to actual sector consumption. Table 5-2 shows the climate zones and the areas of Cascade’s service territory in Washington and Oregon assigned to each zone. For the commercial sector, the EUI factors provided consumption by end-uses and were based on information developed from a Washington Natural Gas study prepared in 1995. For the industrial sector, Stellar developed sharedown fractions that allocated therm sales to specific end-uses.

**Table 5-2
CLIMATE ZONES**

WASHINGTON				OREGON	
ZONE 1	ZONE 2	ZONE 3		ZONE 1	ZONE 2
Bellingham Mount Vernon	Aberdeen Bremerton Longview	Sunnyside Tri-Cities Walla Walla Wenatchee Yakima		Bend	Baker Ontario Pendleton

Stellar then applied the company’s forecasted growth rate to estimate the customer base available in future years. As a part of updating the Washington study mentioned above, Cascade revised Stellar’s original forecasted growth with the current expectations for the growth in both residential and commercial/industrial sectors. The forecasted growth rate is based on the demand forecast information discussed in Section 3 earlier in this plan.

Lastly, Stellar reviewed information on specific measures for applicability to Cascade’s customer base. This information includes estimates of incremental cost and savings but also assesses the market potential for specific measures. Applicability of some measures might depend on the fuel for space heating, for example. Also, the amount of remaining potential is affected by the extent to which the market for a specific product is currently saturated. Stellar’s team used a wide variety of resources to estimate information for the individual measures. Where available, the Northwest Power and Conservation Council’s (NPCC) Regional Technical Forum (RTF) data was utilized in the residential sector to collect costs and energy benefits. In addition, the NPCC libraries provided cost and benefit data for many of the commercial sector measures. In some cases, technical papers or data provided by manufacturers was used. To determine the applicability of measures to the service territory and to assess market

conditions, economic and census data was collected from Economy.com and from the U.S. Census Bureau and the Department of Housing and Urban Development.

Oregon Conservation Study Results

The complete list of the measures and their applicability to Cascade's Oregon Service territory is included in Appendix D. However, before developing the achievable potential and ultimately the 20-year DSM supply curves, the technical potential needs to be screened based on some level of estimated avoided costs. For purposes of the Oregon study, the ETO chose to include measures screen at \$.70 avoided costs, however, they included the Solar measures, which have costs above that threshold as the Trust already includes those measures in their conservation resource stack. Table 5-3 shows the group of residential measures and their technical applicability in Cascade's Oregon service territory.

On the commercial side and industrial side, measures were also screened at \$0.70 per therm. Table 5-4 shows the list of measures and their technical applicability to Cascade's commercial/industrial market sector in Oregon.

With the list of measures established, the next step was to determine the achievable potential and the 20-year DSM deployment scenario along with the associated annual utility costs to determine the level of funding that will be necessary to obtain those therm savings. As mentioned earlier, Stellar estimated achievable potential by multiplying technical savings by 85%, a standard established by the Northwest Power and Conservation Council that has historically been used to determine the achievable potential for electric conservation measures. The measures were then grouped into categories (SF New construction, SF Retrofit, etc) to show a total achievable potential and deployment curves were developed utilizing the following key assumptions:

- In the area of Residential New Construction and Replacement it was assumed that the achievable potential would be spread equally over the 20 year planning horizon. Participation levels each year would ramp up from 15% in 2009 up to 75% by 2016.
- Participation in the Residential Retrofit was also assumed to continue to ramp-up over the 20 year planning horizon. It was assumed that over the 20 year horizon, that 80% of the achievable potential would be realized through the residential programs. Participation levels were assumed to range from 4% in 2009 reaching a maximum of 6% in 2014.
- In the Commercial retrofit market, similar to the residential retrofit market, it was assumed that participation levels would range from 4% in 2009 to a maximum of 6% in the 2014 period.

**Table 5-3
RESIDENTIAL CONSERVATION MEASURES
TECHNICAL POTENTIAL BY 2030**

OREGON			
Measure Code	Measure Description	Gas Savings Therms	Levelized Cost (\$/th)
R-GH115	AFUE 90 to hydrocoil combo, Z 1	308,136	\$0.09
R-GH118	AFUE 90 to hydrocoil combo, Z 2	302,706	\$0.09
R-GH116	Boiler to Polaris Combo radiant, Z 1	715,671	\$0.55
R-GH119	Boiler to Polaris Combo radiant, Z 2	684,763	\$0.57
R-GH125	Duct Sealing and AFUE 90+ , Z 2	1,728,412	\$0.20
R-GH114	Duct Sealing, Z 1	80,756	\$0.28
R-GH117	Duct Sealing, Z 2	73,292	\$0.30
N-GH133	Ducts Indoor, DHW, Lights (Gas Z 1)	2,686,054	\$0.24
N-GH138	Ducts Indoor, DHW, Lights (Gas Z 2)	2,024,871	\$0.31
N-GH129	E* Insulation, Ducts, DHW, Lights (Gas Z 1)	2,130,840	\$0.40
N-GH134	E* Insulation, Ducts, DHW, Lights (Gas Z 2)	1,522,719	\$0.56
N-A103	Estar Dishwasher, New	886	\$0.63
R-A103	Estar Dishwasher, Replacement	65,592	\$0.63
N-GH130	Heating upgrade (AFUE 90) (Z 1)	198,215	\$0.16
N-GH135	Heating upgrade (AFUE 90) (Z 2)	149,424	\$0.21
N-A105	Hi-eff Washer	2,033	-\$2.15
N-GH132	HRV, E* (Gas Z 1)	1,963,928	\$0.22
N-GH137	HRV, E* (Gas Z 2)	1,480,499	\$0.29
N-A102	MEF 2.0 Washer, New	4,611	-\$1.63
R-A102	MEF 2.0 Washer, Replacement	154,270	-\$1.63
R-GD113	Solar hot water heater (50 gal) - With gas backup.	134,556	\$0.93
N-GH139	Tank upgrade (50 gal gas)	390,983	\$0.63
N-GD106	Tank upgrade (50 gal gas) Hi Eff Alternative, New	223,054	\$0.02
R-GD111	Tank upgrade (50 gal gas) Hi Eff Alternative, Replacement	872,299	\$0.02
N-GD108	Tankless Gas heater	1,258,603	\$0.83
R-GD110	Tankless Gas heater replace	229,289	\$0.32
N-GD109	Upgrade to Navien Tankless Gas heater	182,129	\$0.39
N-GD109	Upgrade to Navien Tankless Gas heater	33,492	\$0.39
R-GW123	Wx insulation (add walls), Z 1	143,816	\$0.19
R-GW128	Wx insulation (add walls), Z 2	952,980	\$0.18
R-GW122	Wx insulation (ceiling, floor), Z 1	156,318	\$0.24
R-GW127	Wx insulation (ceiling, floor), Z 2	1,028,694	\$0.24
TOTAL TECHNICAL POTENTIAL		21,883,891	

**COMMERCIAL/INDUSTRIAL CONSERVATION MEASURES
TECHNICAL POTENTIAL BY 2030**

OREGON COMMERCIAL		
Measure Description	Gas Savings Therms	Levelized Cost (\$/th)
Shell Measures	673,000	\$0.30
Retrofit Ventilation	327,000	\$0.36
Heat Reclaim	207,000	\$0.45
Replace Heaters	319,000	\$0.82
O&M and Controls	151,000	\$0.39
DHW Measures	92,000	\$0.66
Replace Windows	73,000	\$0.90
Replace Boiler	70,000	\$0.59
Cooking	39,000	\$0.29
Solar Hot Water	4,000	\$0.77
New HVAC	448,000	\$1.19
New Heaters	144,000	\$0.65
New Heat Reclaim	104,000	\$0.45
New Boilers	57,000	\$0.49
New DHW Measures	47,000	\$0.96
New Windows	38,000	\$0.85
New Cooking	10,000	\$0.29
TOTAL TECHNICAL POTENTIAL	2,803,000	

- In the Commercial/Industrial New Construction and Replacement markets, the achievable potential was spread evenly over the 20 year planning horizon. On the new construction side, participation levels ramp up from 50% in 2009 to 75% program in 2015. In the replacement market, the ramp up period is a little slower beginning at 40% in 2009 and reaching the maximum participation level of 75% in 2016.
- In developing the estimated costs to achieve the annual therm savings targets, it was assumed that ETO could achieve the therm savings targets for \$5/therm.
- Annual therm savings targets associated with the Low Income WAP have been included in the deployment curves as a separate line item as they are separate from the ETO’s targets. The Resource Assessment prepared by Stellar, includes the Conservation potential associated with the Low Income housing stock.

Based on the assumptions outlined above, the estimated annual therm savings targets for Cascade’s Oregon service territory over the 20 year planning horizon are shown in Table 5-5.

TABLE 5-5

	ANNUAL THERM SAVING TARGET			
	Residential Sector	Commercial Sector	Low Income	Oregon Total
2009	220,597	52,060	10,000	282,657
2010	261,219	56,718	12,000	329,937
2011	329,054	62,700	15,000	406,754
2012	390,440	68,683	15,000	474,122
2013	451,826	74,665	15,000	541,491
2014	513,212	78,548	15,000	606,760
2015	533,523	83,205	15,000	631,728
2016	553,834	85,763	15,000	654,597
2017	553,834	85,763	15,000	654,597
2018	553,834	85,763	15,000	654,597
2019	569,955	85,763	15,000	670,717
2020	569,955	85,763	15,000	670,717
2021	569,955	85,763	15,000	670,717
2022	569,955	85,763	15,000	670,717
2023	569,955	85,763	15,000	670,717
2024	525,740	83,113	15,000	623,852
2025	481,525	80,463	15,000	576,987
2026	437,310	77,813	15,000	530,122
2027	415,202	76,488	15,000	506,690
2028	415,202	76,488	15,000	506,690
Cumulative				
Total	9,486,127	1,557,040	292,000	11,335,167

It should be noted, that the figures shown for the residential and commercial sector represent the ETO’s best case scenario annual therm savings targets for the planning horizon. In their annual budgeting process the ETO will typically develop their minimum target by applying 75% to their best case scenario to develop a range of therm savings to be achieved. For the 2009 period, the estimated range of annual therm savings for Cascade’s program would be between 204,493 and 272,657 and the estimated costs to achieve those therm savings would range between \$1,022,465 and \$1,363,285. Comparing the estimated funding requirements to Cascade’s estimated public purpose funding it is anticipated that the current level of funding will be adequate for the 2009 period, somewhat due to estimated 2008 carry-over of approximately \$200,000. However, both the Company and ETO agree that both the public purpose funding revenues and program expenditures will need to be monitored closely. By 2010, it is anticipated to achieve therm savings between 238,453 and 317,937 will result in costs of \$1,192,265 to \$1,589,685 and the adequacy of the current public purpose funding levels will need to be revisited for the 2010 period.

As Table 5-5 suggests, Cascade anticipates its Oregon Low Income Weatherization Program will be able to achieve a savings of 10,000 therms in CY09, 12,000 in CY10, leveling of to a savings of 15,000 therms in CY11 and beyond. These numbers were determined by analyzing the capacity and limitations of the weatherization delivery

network as well as the potential for alternative avenues of therm savings during the years ahead.

The Oregon weatherization delivery network has helped Cascade identify a missed opportunity for potentially significant therm savings in multifamily dwellings primarily designated for the long-term habitation of low-income individuals. Such housing stock, often developed as new construction by 501c3 nonprofit organizations, cannot be reached by the state's current weatherization program. These projects would provide an opportunity to more readily achieve our target savings of 15,000 therms by CY11. CNGC is exploring tariff modifications that would allow custom rebates for projects such as these where proven reasonable and cost effective.

Meanwhile, Oregon's WAP network has also revealed a thriving customer-education program which has been effective in altering the long-term energy usage behavior of weatherization-qualified households. Cascade is currently working with the agencies that deliver this program to develop a long-term study to more easily quantify the savings resulting from such educational efforts.

Washington Conservation Study Results

As mentioned earlier, in 2008 the ETO approached Stellar to update the 2006 Oregon study. This Oregon update provided Cascade the opportunity to apply the relevant revisions seen in the Oregon assessment to the Washington study prepared in 2006. The resulting complete list of measures and their applicability to Cascade's Washington service territory are included in Appendix D-3 & D-4. For purposes of the Washington Study, the technical potential was screened at approximately \$0.85 per therm which is based on the levelized cost per therm from the Company's 2007 IRP as it is anticipated that there has not been a significant change in the long-term gas price forecasts since the prior Plan was completed.

Table 5-6 shows the group of residential measures and their technical applicability in Cascade's Washington service territory. In some cases, the measure cost in one zone may be greater than the \$0.85 threshold, however, when the measure is done in conjunction with an overall program, the Company believes the program will still be cost effective. In those circumstances, promotion of that measure in the less cost-effective zone may be limited.

Table 5-7 shows the list of measures and their technical applicability to Cascade's commercial/industrial market sector. It should be noted that more than 1/3 of the commercial/industrial technical potential is associated with Refrigeration Heat Reclaim measures. Based on discussion with the ETO these measures are predominately utilized in electric applications. The company is concerned that such installations are outside the means of the majority of the small commercial customers that occupy the Company's Washington service territory.

Table 5-6

**RESIDENTIAL CONSERVATION MEASURES
TECHNICAL POTENTIAL BY 2030**

WASHINGTON			
Measure Code	Measure Description	Gas Savings Therms	Levelized Cost (\$/th)
R-H104	AFUE 90+ Furnace, Zone 1	1,031,683	\$0.80
R-H106	AFUE 90+ Furnace, Zone 3	1,859,161	\$0.66
R-GH116	Boiler to Polaris Combo radiant	6,454,454	\$0.55
R-H110	Combo with Hot Water delivery, Zone 1	17,378	\$0.79
R-H111	Combo with Hot Water delivery, Zone 2	33,944	\$0.82
R-H112	Combo with Hot Water delivery, Zone 3	28,301	\$0.72
R-H113	Duct Sealing and AFUE 90+, Zone 1	168,839	\$0.54
R-H114	Duct Sealing and AFUE 90+, Zone 2	316,149	\$0.58
R-H115	Duct Sealing and AFUE 90+, Zone 3	305,125	\$0.44
R-H101	Duct Sealing, Zone 1	117,936	\$0.68
R-H102	Duct Sealing, Zone 2	209,331	\$0.78
R-H103	Duct Sealing, Zone 3	226,742	\$0.53
N-H101	E* Insulation, Ducts, Zone 1	2,001,279	\$0.54
N-H102	E* Insulation, Ducts, Zone 2	4,342,203	\$0.50
N-H103	E* Insulation, Ducts, Zone 3	3,955,216	\$0.41
N-H114	E* Plus (FTC) Insulation, Zone 2	4,469,564	\$0.81
N-H115	E* Plus (FTC) Insulation, Zone 3	4,143,104	\$0.64
N-A103	Estar Dishwasher, New	302,308	\$0.63
R-A103	Estar Dishwasher, Replacement	5,105	\$0.67
N-H104	Heating upgrade (AFUE 90), Zone 1	681,235	\$0.69
N-H105	Heating upgrade (AFUE 90), Zone 2	1,811,898	\$0.52
N-H106	Heating upgrade (AFUE 90), Zone 3	1,079,008	\$0.64
N-A105	Hi-eff Washer	11,714	-\$2.15
N-H112	HRV, E*, Zone 3	889,527	\$0.81
N-A102	MEF 2.0 Washer, New	26,566	-\$1.63
R-A102	MEF 2.0 Washer, Replacement	711,016	-\$0.19
N-GD109	Upgrade to Navien Tankless Gas heater, New	1,049,264	\$0.81
R-GD112	Upgrade to Navien Tankless Gas heater, Replacement	154,360	\$0.39
R-WG104	Wx insulation 1 added measure Zone 1	295,663	\$0.14
R-WG105	Wx insulation 1 added measure Zone 2	577,721	\$0.14
R-WG106	Wx insulation 1 added measure Zone 3	500,847	\$0.12
R-WG101	Wx insulation 2 measures Zone 1	486,530	\$0.58
R-WG102	Wx insulation 2 measures Zone 2	951,120	\$0.60
R-WG103	Wx insulation 2 measures Zone 3	820,810	\$0.51
TOTAL TECHNICAL POTENTIAL		40,035,102	

**Table 5-7
COMMERCIAL/INDUSTRIAL CONSERVATION MEASURES
TECHNICAL POTENTIAL BY 2030**

WASHINGTON COMMERCIAL		
Measure Description	Gas Savings Therms	Levelized Cost (\$/th)
Shell Measures	11,606,000	\$0.19
Refer Heat Reclaim	9,410,000	\$0.03
Cooking	2,646,000	\$0.31
Replace Heaters	1,717,000	\$0.49
O&M and Controls	1,245,000	\$0.35
DHW Measures	839,000	\$0.35
Replace Boiler	437,000	\$0.60
Solar Pool Heat	147,000	\$0.09
New Refer Heat Reclaim	5,556,000	\$0.03
New Windows	4,625,000	\$0.19
New Heaters	975,000	\$0.42
New Cooking	944,000	\$0.31
New Boilers	673,000	\$0.53
New DHW Measures	405,000	\$0.44
New Solar Pool Heat	32,000	\$0.24
TOTAL COMMERCIAL	41,257,000	
INDUSTRIAL		
Boilers	442,000	\$0.18
Shell Measures	294,000	\$0.22
Unit Heater	176,000	\$0.18
Process Hot Water	47,000	\$0.10
Specialty Hot Water	16,000	-\$0.81
TOTAL INDUSTRIAL	975,000	
TOTAL TECHNICAL POTENTIAL	42,232,000	

Based on the above technical potential, the Company has developed an estimate of the incremental conservation resources that can be acquired through 2028 on an annual basis. The company followed the approach used to develop the targets for Oregon, making modifications when necessary to recognize the differences associated with Cascade’s Washington service territory.

One of the modifications, similar to that made with the original study was to the use an achievable potential of 75% rather than the 85% assumed by Stellar. The 75% achievable potential represents an increase from the achievable levels assumed in the prior IRP, however, is lower than that used by NPCC for electric conservation planning. The lower achievable potential is necessary since gas efficiency measures have not been as widely accepted, primarily due to the incremental costs that must be born by the customer to install those measures compared to the amount of incentive the utility could provide. Consistent with the development of the Oregon deployment curves, Cascade

grouped the measures into categories (SF New construction, SF Retrofit, etc) to show a total achievable potential and deployment curves were developed utilizing the following key assumptions:

- In general it is assumed that the participation level percentages will be lower than in Oregon as the program is only in its second year and new programs are assumed to have a slower start up since it takes time to build the network of trade allies to deliver these programs.
- In the area of Residential New Construction it was assumed that the achievable potential would be spread equally over the 20 year planning horizon. Consistent with results seen by the ETO in the first few years of their gas programs, the participation levels gradually ramp up assuming 5% participation in 2009 and reaching maximum participation of 75% in 2018.
- In the area of Residential replacement market, similar to the new construction sector, it was assumed that the achievable potential would be spread equally over the 20 year planning horizon. Participation levels begin at 20% in 2009 reaching maximum participation of 80% in 2017.
- Participation in the Residential Retrofit was also assumed to continue to ramp-up over the 20 year planning horizon. Similar to the Oregon approach, it was assumed that over the 20 year horizon, that 80% of the achievable potential would be realized through the residential retrofit program. Since 2009 is only the second year retrofit measures being included in the Company's residential program participation levels were assumed to range from 2% in 2009 reaching a maximum of 6% in 2017.
- In the Commercial retrofit market, similar to the residential retrofit market, it was assumed that participation levels would range from 2% in 2009 to a maximum of 6% in the 2017 period.
- In the Commercial/Industrial New Construction and Replacement markets, the achievable potential was spread evenly over the 20 year planning horizon. On the new construction side, participation levels ramp up from 10% in 2009 to 75% in 2022. In the replacement market, the ramp up period is begins at 15% in 2009 and increases 5% per year until reaching the maximum participation level of 75% in 2022.
- Refrigeration heat reclaim in new and existing facilities represents a significant portion of the technical potential in the Commercial Sector. As mentioned earlier, Cascade has concerns about the validity of these estimates, particularly considering Cascade small commercial basis. However, the Company is hesitant to completely discount it and has assumed that some level, although

quite small, can be achieved on an annual basis beginning in 2010 through its custom program.

- Annual therm savings targets associated with the Low Income Weatherization program have been included in the deployment curves as a separate line item. The Low Income Weatherization program is delivered by the Community Action agencies rather than the third party contactor who delivers the residential program and therefore separate targets are necessary. The Resource Assessment prepared by Stellar, includes the conservation potential associated with the Low Income housing stock.
- In developing the estimated costs to achieve the annual therm savings targets, it was assumed that commercial therm savings could be achieved at \$4/therm while the residential sector would require approximately \$7.50/therm.

Based on the assumptions outlined above, the estimated annual therm savings targets for the Washington Residential and Commercial/Industrial programs are shown in Table 5-8 below.

TABLE 5-8

	ANNUAL THERM SAVING TARGET			
	Residential Sector	Commercial Sector	Low Income	Washington Total
2009	240,737	230,469	26,250	497,456
2010	332,180	329,403	35,500	697,083
2011	423,622	428,337	45,000	896,959
2012	515,065	537,854	45,000	1,097,919
2013	648,185	668,858	45,000	1,362,043
2014	797,502	799,861	45,000	1,642,364
2015	946,820	930,865	45,000	1,922,685
2016	1,096,137	1,061,869	45,000	2,203,006
2017	1,245,455	1,192,873	45,000	2,483,327
2018	1,287,132	1,302,284	45,000	2,634,416
2019	1,287,132	1,411,695	45,000	2,743,827
2020	1,287,132	1,521,106	45,000	2,853,239
2021	1,287,132	1,630,518	45,000	2,962,650
2022	1,287,132	1,739,929	45,000	3,072,061
2023	1,287,132	1,739,929	45,000	3,072,061
2024	1,219,997	1,696,744	45,000	2,961,740
2025	1,152,861	1,653,559	45,000	2,851,420
2026	1,085,726	1,610,374	45,000	2,741,099
2027	1,052,158	1,588,781	45,000	2,685,939
2028	1,052,158	1,588,781	45,000	2,685,939
Cumulative Total	19,531,396	23,664,087	871,750	44,067,233

It should be noted, that the figures shown for the residential and commercial sector represent the Cascade's best case scenario annual therm savings targets for the planning horizon. In setting targets subject to penalty provisions under the Company's 2007 Conservation, the company believes that the targets initially established in that Plan for the 2009 and 2010 period are appropriate as they represent roughly 89% of the above best case scenario.

Table 5-8 illustrates that Cascade anticipates its Low Income Weatherization program will be able to achieve a savings target of 26,250 in CY09, and 35,500 in CY10, leveling off to a savings of 45,000 therms in CY11 and beyond. These numbers were determined by analyzing the capacity and limitations of the weatherization delivery network, as well as the potential for alternative avenues of therm savings during the years ahead.

According to the most recent evaluation of the Washington State Low Income Weatherization Program (WAP), released in March of 2008, 77 percent of the homes weatherized by the 10 largest WAP agencies are electrically heated with the remaining 16 percent heated through natural gas. Half of these gas-heated homes are served by weatherization agencies within Cascade's service territory. All remaining Cascade-eligible homes are served by smaller agencies with less capacity to deliver our program. Thus it is essential that the company work closely with eligible agencies not yet integrating the resources available through Cascade into their larger weatherization programs.

The report further illustrates the challenges faced by agencies that must often walk away from housing stock in poor or unsafe conditions. These homes are often in critical need of health and safety repairs before they are able to receive weatherization services and achieve therm savings. The WAP study reveals that low-income natural gas heated homes are often a decade older than their electrically heated counterparts, increasing the likelihood of additional needs within the structure. Therefore it is critical to recognize that the completion of therm saving measures in CNGC homes is often contingent upon the ability of the agencies to receive an adequate amount of home repair funds from the state.

Upon the request of the WAP delivery network, CNGC has drafted and circulated a contractual agreement designed as an assurance of available rebate funds for qualified therm-saving measures throughout the program year. Although this document will not be mandatory for participation in our program, Energy Project staff is confident that such a contract will encourage previously reluctant agencies to leverage funds, hire additional staff and ramp up their capacity to serve our homes through the program year.

Cascade anticipates the participation of two additional agencies in CY2009 and several more following thereafter. Our program will experience a slow but steady period of growth as new agencies join our program and as currently participating agencies increase their public information efforts to encourage greater saturation of our program to our qualified customers. Over the 20-year period outlined below, the number of homes served will continue to rise and fall based on the state of the economy, the price of natural gas, and

the energy burden experienced by those within 60% of the state median income. Agencies that have been early adopters of our program will be the first to peak and level off to a steady number of homes within the next several years.

In the meantime, Cascade will explore the inclusion tariff language facilitating the installation of natural gas conservation measures within affordable housing projects run through 501c3 nonprofit housing organizations such as (but not limited to) Habitat for Humanity and Rebuilding together. Such projects are currently a missed opportunity to mitigate the energy burden of low-income households within our service territory.

Further savings may be achieved through the inclusion of energy savings kits recently approved by the Commission for Cascade's Residential Conservation Program. Such kits may either be circulated directly to Low Income Agencies, distributed through targeted "blitz" campaigns (high volume, low cost), or integrated via partnership with Pacific Power's conservation education efforts targeted towards 5th graders in our mutual service territory. If such initiatives are successful, they will ensure the ability of the Company to achieve the therm saving target of 45,000 by CY11. If growth appears unsatisfactory for achieving this goal, Cascade may also explore the inclusion of a supplemental or alternative delivery network to reach homes which may be less accessible through the WAP.

Conservation Summary

Based on the deployment curves developed for each state as described above, Cascade estimates that the cumulative therm savings targets for the 2 Year Action Plan period (2009 – 2010) represents the displacement of 3,670 residential customer's annual load requirements. By the end of the 20-year planning horizon, the cumulative savings shown in Table 5-9 represents approximately 13% of the Company's overall core load requirements and 52% of the combined technical potential reflected in the earlier tables (Tables 5-2, 5-3, 5-6 and 5-7).

Table 5-9
Estimated Achievable Therm Savings

	Washington			Oregon			Annual Savings	Cumulative Therm Savings
	Residential	Comml/Ind	Low Inc.	Residential	Comml/Ind	Low Income		
2009	240,737	230,469	26,250	220,597	52,060	10,000	780,114	780,114
2010	332,180	329,403	35,500	261,219	56,718	12,000	1,027,020	1,807,134
2011	423,622	428,337	45,000	329,054	62,700	15,000	1,303,713	3,110,847
2012	515,065	537,854	45,000	390,440	68,683	15,000	1,572,041	4,682,888
2013	648,185	668,858	45,000	451,826	74,665	15,000	1,903,534	6,586,421
2014	797,502	799,861	45,000	513,212	78,548	15,000	2,249,123	8,835,544
2015	946,820	930,865	45,000	533,523	83,205	15,000	2,554,413	11,389,957
2016	1,096,137	1,061,869	45,000	553,834	85,763	15,000	2,857,603	14,247,560
2017	1,245,455	1,192,873	45,000	553,834	85,763	15,000	3,137,924	17,385,484
2018	1,287,132	1,302,284	45,000	553,834	85,763	15,000	3,289,013	20,674,496
2019	1,287,132	1,411,695	45,000	569,955	85,763	15,000	3,414,545	24,089,041
2020	1,287,132	1,521,106	45,000	569,955	85,763	15,000	3,523,956	27,612,997
2021	1,287,132	1,630,518	45,000	569,955	85,763	15,000	3,633,367	31,246,364
2022	1,287,132	1,739,929	45,000	569,955	85,763	15,000	3,742,778	34,989,142
2023	1,287,132	1,739,929	45,000	569,955	85,763	15,000	3,742,778	38,731,920
2024	1,219,997	1,696,744	45,000	525,740	83,113	15,000	3,585,593	42,317,513
2025	1,152,861	1,653,559	45,000	481,525	80,463	15,000	3,428,407	45,745,920
2026	1,085,726	1,610,374	45,000	437,310	77,813	15,000	3,271,222	49,017,142
2027	1,052,158	1,588,781	45,000	415,202	76,488	15,000	3,192,629	52,209,771
2028	1,052,158	1,588,781	45,000	415,202	76,488	15,000	3,192,629	55,402,400

DSM Implementation Issues and Uncertainties

The amount of DSM potential identified for the plan relies on the best available information today about prices, efficiency, consumer behavior and preferences, and projects with information 20 years into the future. As with other resources, DSM resource assessments depend heavily on energy load forecasts and projected growth rates with all of the associated uncertainties. Also similar to supply side resource, assessments of DSM potential are limited by what is currently available in the marketplace in terms of cost-effective technologies for improving energy efficiency. The impacts of new technologies and new energy efficiency codes and standards are difficult to accurately predict. This uncertainty is mitigated through the biennial updates of the IRP, which provide the opportunity to incorporate improvements in demand side technologies and programs

However, somewhat unique to the demand side resources is the utility’s dependence on a large number of small purchases with each tied to the individual consumers’ day-to-day purchasing and behavioral decisions. The utility attempts to influence these decisions through its programs, but the consumer is the ultimate decision maker regarding the purchase of DSM resource. Cascades assessments of DSM make the best possible estimates of participation and costs, however, like any new program, the amounts are likely to vary from planning estimates.

Many specific details are required to implement successful programs. As discussed above, actual implementation design, delivery, and market conditions will cause energy-

efficiency program savings and costs to vary. Customer participation in a program is heavily influenced by the level of incentive paid by the utility versus the cost to the customer. External infrastructure considerations must also be addressed, such as product availability to utility customers and an adequate network of contractors, retailers, and other trade allies to support a program. As new measures or expanded programs are developed and added to the current program mix, internal and external resources and capabilities need to grow accordingly and progress through a “learning curve”. For this reason, the company estimated conservation acquisition schedule would increase over time. Additionally, revisions to the company’s existing programs may be necessary and will result in additional impacts on the company’s projected participation levels.

Other uncertainties relating to conservation resources include the risk of free riders, and lost opportunities. Free riders are those individuals that would have undertaken some form of conservation action even if a program had not existed. Measuring free rider impacts makes program evaluation difficult since it requires information on a hypothetical situation that, by definition, will never be observed. Lost opportunities assumes that the opportunity to install cost-effective conservation measures occurs only once in the life of a home, office, or industrial plant. If all potential cost-effective conservation is not installed at one time, future DSM opportunities may be lost as a result. This is most likely true for commercial/industrial resources since it is unlikely that a business would close down or curtail operations for any period just to install conservation measures.

The potential for building code changes over the planning horizon represent another uncertainty that could impact the ability of the company to achieve its therm savings goals. Should code changes be enacted, as they were recently in Oregon, both the Company’s programs and targets will need to be adjusted.

Cascade will also continue to monitor the developments in the area of Carbon legislation. At the state level, specific requirements resulting from the Western Climate Initiative’s (WCI) Greenhouse Gas Cap and Trade design recommendation are still unknown. The recommendations, though, include reducing greenhouse gas emissions to 15% below 2005 levels by 2020. GHG measurements and monitoring would begin on January 1, 2010, for reporting in early 2011. The first phase of the cap-and-trade program would begin on January 1, 2010, covering emissions from electricity. The second phase would begin in 2015, when the program expands to include other fossil fuels, including natural gas. Since both Washington and Oregon are participants in the WCI, the company anticipates that new regulations will be determined during 2009 so the 2010 monitoring timeline can be met.

Although Oregon is a participant in the WCI, its governor, Ted Kulongoski, unveiled his own plan that includes the goal of reducing greenhouse gas levels to 10% below 1990 levels by the year 2020. The multi-faceted plan includes a regional cap and trade program, which if approved by the Legislature, would go into effect in 2012. Also included, among other proposals, are energy efficiency tax incentives and low-income support.

At the Federal level, in 2008, the Senate debated “Cap-and-trade” legislation proposed in the Lieberman-Warner bill that would create a federal cap-and-trade market as early as 2011. Although the bill failed to pass, it is anticipated that 2009 will offer a more receptive political climate under the Obama administration. In the House, the Dingell and Boucher Climate Change Bill, on which hearings are scheduled to begin in 2009, would start in 2012 by imposing emission restrictions on electric utilities. Residential and commercial local distribution companies for natural gas would be covered in 2017. Under the proposal, U.S. emissions would be reduced to 6% below 2005 levels by 2020, 44% below 2005 levels by 2030 and 80% below 2005 levels by 2050.

Recently, Rep. Waxman replaced Rep. Dingell as chair of the House Energy and Commerce Committee, and there is speculation that this will accelerate government efforts to curb greenhouse gases. Waxman wants to implement much stricter emission reductions sooner, and across a broader spectrum of the economy than Dingell has proposed. Waxman’s views on greenhouse gas legislation are similar to what the Obama administration is seeking – a reduction to 1990 emissions by 2020 and 80% below 1990 levels by 2050.

Environmental Externalities

When evaluating DSM resources, the company also includes an evaluation of the impacts of environmental externalities. The impact of utilizing energy on the environment continues to be a subject of societal concern and debate. If there are impacts that cannot be repaired naturally within a reasonable period of time, damage cost to the environment occurs for which society will have to pay in some, as yet undetermined, form. The question of who pays, how much and when payment should be made, are complicated issues.

For many years, The Northwest Power and Conservation Council (NPCC) has utilized a 10% cost advantage for electric utilities acquiring conservation resources to realize the benefits of not using supply side resources. Such electric utility benefits include reduced fish and wildlife impacts, load stability, load predictability and improved air quality. Cascade has also included the 10% cost advantage for conservation resources which is consistent with Oregon’s requirements for gas utilities for mandated residential weatherization programs.

The OPUC issued Order 93-965 (UM-424) to address how utilities should consider the impact of environmental externalities in planning for future energy resources that goes beyond the 10% cost advantage discussed above. The required analysis, as specified in OPUC Order 93-965, showed the potential cost impacts to range from \$0.080 per therm to \$0.315 per therm under the various scenarios. This range is based on the emission cost adders as specified in the OPUC order updated for inflation. The analysis considers the natural gas cost impacts from emitting carbon dioxide (CO₂) and nitric-oxide (NO₂). Since these guidelines are over a decade old, the company compared the estimated carbon emissions discussed in the EIA International Outlook for natural gas use to the estimated levels utilized in the OPUC order. Based on information contained in the EIA’s 2007 International Outlook, natural gas emissions are approximately 11.64 lbs/therm.

In June 2008, the OPUC issued Order 08-338 (UM1302) which revised the IRP Guidelines established in UM1056 regarding the analysis of environmental costs (guideline 8). The original guideline established in UM1056, required utilities to analyze the range of potential CO₂ costs referenced in Order 93-965. However, the most recent order is silent on the range of costs that must be analyzed. Rather, the revised guideline requires the utility should construct a basecase portfolio to reflect what it considers to be the most likely regulatory compliance future for the various emissions. Additionally the guideline requires the utility to develop several compliance scenarios ranging from the present CO₂ regulatory level to the upper reaches of credible proposals and each scenario should include a time profile of CO₂ costs. The utility is also required to include a “trigger point” analysis in which the utility must determine at what level of carbon costs its selection of portfolio resources would be significantly different.

Unlike electric utilities, environmental cost issues rarely impact a gas utility's supply-side resource choices. For example, Cascade cannot choose between coal-fired generation or wind energy sources to meet its load requirements. As a natural gas distribution company, the Company's only supply-side energy resource is natural gas. However, environmental externality costs do make a difference in the comparison between supply-side and demand-side resources.

At the time of this writing, specific details on the level of carbon allowances and how they may be allocated to the gas utilities under a cap and trade program are still unknown. Therefore, in an effort to create a more realistic and robust assumption with regard to potential Carbon legislation, Cascade looked to the recent carbon tax enactment in British Columbia for preliminary insight. Given the timing, geographic proximity, and partnership in the WCI, Cascade utilized the growth rate of the British Columbia carbon tax to forecast potential Externality Adder costs up to five years after such legislation is passed. Table 5-10 shows the updated analysis and forecast. Cascade has compared the initial range of carbon costs (\$12/ton to \$50/ton) and believes that the range captures the most likely costs along with the upper reaches consistent with the Commission's guideline.

Other Demand Side Management

The general purpose of demand response is to help manage demand during periods of system stress. The term encompasses a number of activities including real time pricing, time of use rates, critical peak pricing, demand buyback, interruptible rates, and direct load controls. As discussed earlier, the majority of Cascade's annual throughput is for non-core transportation service customers who are responsible for securing their own pipeline capacity arrangements. Of the remaining industrial sales, approximately 25% of that load is being met through interruptible sales service. Interruptible service is attractive for large volume customers because of the lower distribution margin involved.

As a result, the company believes that all customers that can manage their operations on interruptible service are currently served on an interruptible basis – leaving little opportunity to reduce peak loads through expanded interruptible service.

Table 5-10

Natural Gas Environmental Externality Cost Analysis
(OPUC Order 93-695)
Updated with EIA's Estimated Emission Factors & Inflation

Emission		Emission (Lbs/Therm)	Cost (\$/Lb)	Externality Adder (\$/Therm)	Forecasted Externality Adder (\$/Therm) (Years After Enacted)				
SCENARIO 1									
					1	2	3	4	5
NO2	\$2500/Ton	0.008	\$1.250	\$0.010	\$0.010	\$0.015	\$0.020	\$0.025	\$0.030
CO2	\$12/Ton	11.640	\$0.006	\$0.070	\$0.070	\$0.105	\$0.140	\$0.175	\$0.210
TOTAL				\$0.080	\$0.080	\$0.120	\$0.160	\$0.200	\$0.240
SCENARIO 2									
					1	2	3	4	5
NO2	\$2500/Ton	0.008	\$1.250	\$0.010	\$0.010	\$0.015	\$0.020	\$0.025	\$0.030
CO2	\$30/Ton	11.640	\$0.015	\$0.175	\$0.175	\$0.262	\$0.349	\$0.437	\$0.524
TOTAL				\$0.185	\$0.185	\$0.277	\$0.369	\$0.462	\$0.554
SCENARIO 3									
					1	2	3	4	5
NO2	\$2500/Ton	0.008	\$1.250	\$0.010	\$0.010	\$0.015	\$0.020	\$0.025	\$0.030
CO2	\$50/Ton	11.640	\$0.025	\$0.291	\$0.291	\$0.437	\$0.582	\$0.728	\$0.873
TOTAL				\$0.301	\$0.301	\$0.452	\$0.602	\$0.753	\$0.903
SCENARIO 4									
					1	2	3	4	5
NO2	\$6000/Ton	0.008	\$3.000	\$0.024	\$0.024	\$0.036	\$0.048	\$0.060	\$0.072
CO2	\$12/Ton	11.640	\$0.006	\$0.070	\$0.070	\$0.105	\$0.140	\$0.175	\$0.210
TOTAL				\$0.094	\$0.094	\$0.141	\$0.188	\$0.235	\$0.282
SCENARIO 5									
					1	2	3	4	5
NO2	\$6000/Ton	0.008	\$3.000	\$0.024	\$0.024	\$0.036	\$0.048	\$0.060	\$0.072
CO2	\$30/Ton	11.640	\$0.015	\$0.175	\$0.175	\$0.262	\$0.349	\$0.437	\$0.524
TOTAL				\$0.199	\$0.199	\$0.298	\$0.397	\$0.497	\$0.596
SCENARIO 6									
					1	2	3	4	5
NO2	\$6000/Ton	0.008	\$3.000	\$0.024	\$0.024	\$0.036	\$0.048	\$0.060	\$0.072
CO2	\$50/Ton	11.640	\$0.025	\$0.291	\$0.291	\$0.437	\$0.582	\$0.728	\$0.873
TOTAL				\$0.315	\$0.315	\$0.473	\$0.630	\$0.788	\$0.945

Section 6

Supply Side Resources

Cascade's core market residential and small volume commercial and industrial customers expect and require the highest reliability of energy service. Because of the Company's obligation to provide gas service to these customers, the Company must determine and achieve the needed degrees of service reliability and attain the lowest costs possible while providing an infrastructure that responds to the customers' concerns, meets customer growth and provides all necessary administrative services to provide the stated services. Assuming such an infrastructure is in place and operating effectively, the most important functions necessary for reliable natural gas service are planning for, providing and administering the gas supply, interstate pipeline transportation capacity, and distribution service components that constitute the "bundled services" required by core market customers.

Cascade's 20-year supply side resource goal is to continue to meet the energy needs of its core market customers with a package of services that combine adequate gas supplies and cost-effective winter peaking services with long-term pipeline transportation contracts and sufficient distribution system capacity at the lowest possible cost.

This section describes the various gas supply resource and transportation resource options that are available to the Company as supply side resources.

Gas Supply Resource Options

Gas supply options available to Cascade to meet the core market demand requirements generally fall into two groups 1) Firm gas supplies on a short or long-term basis, and 2) Short term gas supplies purchased on the open market as needed for a particular month for one or more days. A separate and important source of gas supply is natural gas storage service, which is required to meet the needs of the broad seasonal peak and the needle peaks of the heating season in order to provide economical service to low load factor customers.

Firm Supply Contracts

Firm supply contracts commit both the seller and the buyer to deliver and take gas on a firm basis, except for *force majeure* conditions. From Cascade's perspective, the most important consideration is the seller's contractual commitment to make gas available day in and day out, regardless of market conditions. Firm supplies are a necessary component of Cascade's core market portfolio given the obligation to serve and the lack of easily obtainable alternatives for consumers during periods of peak demand. Firm contracts can provide baseload services, provide seasonal peaking services during the winter months, or can be used to meet daily needle peaking requirements. Each of these services is discussed briefly below.

Baseload resources are those that are taken day in and day out, 365 days a year. As a result, baseload gas tends to be the least expensive of the firm supply contracts because it matches the production of gas and guarantees the producer that the volumes will be taken. Cascade's ability to contract for baseload supplies is limited

because of the relatively low summer demand on the system. Baseload resources are used to meet the non-weather sensitive portion of the core market requirements, or may be used to refill storage reservoirs during periods of lower demand.

Winter gas supplies are firm gas supplies that are purchased for a short period during the winter months to cover increased loads, primarily for space heating. The contracts are typically 3 to 5 month durations (primarily November through March). This enables the Company to ensure firm winter supplies without incurring obligations for high levels of take during periods of low demand in the summer months. Winter supplies combined with baseload supplies will be adequate to cover the moderately cold days in winter.

Peaking gas supplies, similar to storage, are firm contracts purchased only as load actually materializes due to high winter demand. That is, the producer must deliver the gas when the Company requires it, but the Company is not required to take gas unless needed to meet customer load requirements. Peaking resources typically allow the Company to take between 15 and 20 days of service during the winter period. These resources are more expensive than baseload or winter supplies and typically include fixed charges to cover the costs for the producers to stand by to deliver the supplies.

Needle peaking resources are utilized during severe or "arctic" cold experiences when demand can increase sharply. These resources are very expensive and are available for a very short period of time. One source of needle peaking gas supply, that is actually a form of demand side management, may be obtained from Cascade's industrial customer base. These customers would be required to maintain standby or alternate fuel capability that Cascade would contract the right to request the customer to switch to so Cascade could utilize (divert) their gas supply and transportation capacity to meet the Company's core market requirements. The benefits associated with this type of resource would include lowering the demand of the industrial facility, and providing a like amount of additional gas supply with pipeline capacity to meet core demand. Needle peaking requirements can also be met through the use of propane air plants, or on-site liquefied natural gas (LNG) facilities.

Contract terms for firm commodity supplies vary greatly. Some contracts specify fixed prices, while others are based on indexes that float from month to month. Some contracts have fixed reservation charges assessed each month, while others may have minimum daily or monthly take requirements. Most contain penalty provisions for failure to take the minimum supply gas according to the contract terms. Contract details will also vary from year to year, depending on company and supplier needs and the general trends in the market.

Appendix E summarizes the gas supply alternatives evaluated during this planning cycle.

Spot Market Supplies

Gas that is purchased for a short period of time (1 to 30 days) when neither the seller nor the buyer has a longer-term firm commitment to deliver or take the gas is referred to as a spot market purchase. Spot market supplies differ from firm resources in that they are more volatile, both in terms of availability and price, and are largely influenced by the laws of supply and demand.

In general, spot market supplies are provided from gas supplies not under any long-term firm contract, as mentioned above. Therefore, as firm market demand decreases, more gas becomes available for the spot market. Prices for spot market supplies are market driven and may be either lower or higher than prices under firm supply contracts. In warmer weather, as firm market demand requirements decrease, usually more gas becomes available for the spot market, resulting in lower prices. In colder weather, as firm markets demand their gas supplies, the remaining spot market supplies can carry higher prices until the price equates or exceeds that of alternate energy supplies (such as oil or electricity). Spot supplies can be expected to move to the markets that offer the highest price, which in turn can affect delivery reliability.¹

Due to the potential for interruption of the spot market, these supplies are not considered as reliable a source of gas supply for the winter peaking requirements of Cascade's core market. As identified earlier, part of the reason these supplies are considered less reliable is that these volumes are made available after longer-term firm commitments have been contracted for delivery by upstream suppliers. These available volumes are likely to vary daily, depending on production or the suppliers' ability to store un-marketed supply. Under the NAESB (North American Energy Standards Board) contract, which is the standard contract used by buyers and sellers when entering into short term supply transactions parties have the ability to identify firm variable or interruptible quantities for these supplies. Therefore, these spot volumes are more susceptible to daily operational constraints on the upstream pipelines. This is particularly true in the case of Northwest Pipeline, which is a displacement pipeline with bi-directional flow. Depending on how gas is scheduled versus actually flowing between compressor stations, constraints can possibly occur. Complicating matters is that each of the pipelines has multiple supply scheduling deadlines, allowing scheduled volumes to be adjusted. As a result, at any given point in the process, constraints can occur, leading to the potential of the scheduled spot supply volumes being reduced or not delivered to the citygate at all.

The role for spot market gas supply in the core market portfolio is based upon economics. Spot market supplies may be used to supplement firm contracts during periods of high demand or to displace other volumes when it is cost-effective to do so. For example, should prices in one basin drop radically compared to another basin, a contract may allow the flexibility to reduce takes in order to take advantage of supply

¹ It should be noted that in an rare instances, a combination of pipeline capacity constraints, excess supply, high storage levels can lead to unusual spikes in natural gas prices during the summer months, as witnessed during 2008, when natural gas prices soared to \$13 per MMBtu in early July, 2008

from a lower priced basin. Depending upon availability and price, spot market volumes may be used in place of storage withdrawal volumes to meet firm requirements on a given day or for mid-heating season refills of storage inventory during periods of weather moderation.

Other Unconventional Gas Supply Resources

Cascade considers Unconventional Gas Supply Resources such as supplies from an LNG Import Terminal, bio-gas or other manufactured gas supply opportunities as speculative supply side resources at this point in time. In most cases Unconventional Gas Supply Resources would become an alternative to traditional gas supplies from the conventional gas fields in Canada or the Rockies and would have to compete for inclusion in the Company's portfolio planning.

For example, there are four LNG Import Terminal projects currently in various stages of development in the Pacific Northwest. These projects include Kitimat LNG in Northwest British Columbia; Bradwood Landing on the Columbia River near Clatskanie, Oregon; Oregon LNG in Warrenton, Oregon, and Jordan Cove LNG in Coos Bay, Oregon. These projects also include planned pipeline infrastructure to move gas supplies. The LNG pipeline projects included for discussion during this planning horizon are identified below:

- Kitimat LNG: Pacific Trail Pipelines will connect a 291 mile pipeline from the proposed facility to WEI's pipeline (Spectra) at Summit Lake.
- Bradwood Landing: Palomar Pipeline would extend 110 miles north from near Molalla, Oregon to the proposed facility near Willamette.
- Oregon LNG: A 117-mile pipeline to connect the proposed LNG terminal in Warrenton, Oregon, to the existing Williams Northwest Pipeline system near Molalla.
- Jordan Cove: The 221-mile Pacific Connector Gas Pipeline would extend from the proposed LNG terminal in Coos Bay across southwest Oregon to the California border at Malin to serve the Pacific Northwest and California markets.

Another alternative is bio-gas. Bio-gas continues to receive increased attention as a possible resource. Biogas typically refers to a gas produced by the biological breakdown of organic matter in the absence of oxygen. Biogas originates from biogenic material and is a type of biofuel. One type of biogas is produced by anaerobic digestion or fermentation of biodegradable materials such as biomass, manure or sewage, municipal waste, green waste and energy crops. This type of biogas comprises primarily methane and carbon dioxide. The principal type of biogas is wood gas which is created by gasification of wood or other biomass. This type of biogas is comprised primarily of nitrogen, hydrogen, and carbon monoxide, with trace amounts of methane.

The gases methane, hydrogen and carbon monoxide can be combusted or oxidized with oxygen. Air contains 21% oxygen. This energy release allows biogas to be used as a fuel. Biogas can be used as a low-cost fuel in any country for any heating purpose, such as cooking. It can also be utilized in modern waste management facilities where it can be used to run any type of heat engine, to generate either mechanical or electrical power. Biogas is a renewable fuel, which can be used for transport, and electricity production, so it attracts renewable energy subsidies in some parts of the world.

In many cases, there is currently not enough pricing and availability information available to be considered in this planning cycle; however, where possible, we have endeavored to analyze those situations where we feel sufficient data is available.

Storage Resources

Cascade also utilizes natural gas storage to meet a portion of the requirements of its core market. Storing gas supplies, purchased and injected during periods of low demand, is a cost-effective way of meeting some of the peak requirements of Cascade's firm market. Natural gas can be stored in naturally occurring reservoirs, such as depleted oil or gas fields, salt caverns or other geological formations with an impermeable cap over a porous reservoir. Gas can also be stored in vessels or tanks under pressure as compressed natural gas, or cooled to a liquid state, which is liquefied natural gas (LNG).

Natural gas storage service is not only an excellent supply source for meeting peak winter demand, but it can also be an important gas supply management tool. Storing excess or unused supply during periods of low demand increases the annual utilization rate of a supply contract, therefore improving the annual load factor for the Company's gas supplies. Improving the annual load factor of a supply contract improves the Company's ability to purchase gas supplies on a more economical basis. Purchasing natural gas for storage during periods of low demand generally yields prices at the low point on the seasonal price curve. The lower cost of supply helps to offset the costs associated with the storage facility.

Depending upon the location of the storage facility, pipeline transportation may also be required. Storage facilities located within the Company's distribution system or on the interstate pipeline are preferable to those located "off-system". Off-system storage requires additional pipeline transportation and may limit the flexibility of the resource. Cascade does not own its' own storage facility and therefore must contract with storage owners to access a portion of their storage capacity. In 1994, Cascade had two contracts for utilization of underground storage located at Jackson Prairie (SGS-1). SGS-1 service is contracted directly from NWP and an additional SGS-1 service was assigned from Avista Corporation for Cascade's use. Both of these contracts provided daily deliverability and seasonal inventory capacity. However, Avista declined to extend its agreement with Cascade and the Avista storage service was no longer available following the 2006/07 heating season.

Consequently, Cascade has entered into an Agreement with Northwest Pipeline for additional Jackson Prairie storage service beginning early as November 1, 2008, that will replace the access to storage that was available through the Avista storage contract. The new Agreement will provide Cascade with twice the amount of daily deliverability than the Avista agreement (30,000 Dth/d vs. 15,000 Dth/d) with approximately the same annual storage quantity. Cascade has also entered into a companion transportation Agreement with Northwest Pipeline for the transportation of gas supplies stored under this Agreement to Cascade's service area.

The Company also has contracted for service (LS-1) from NWP's Plymouth, Washington LNG facility. Both Jackson Prairie facilities and the Plymouth facility are located directly on NWP's transmission system. Therefore, storage withdrawal rates can be changed several times during an individual gas day to accommodate weather driven changes in core customer requirements. This type of operating flexibility would not necessarily be available with off system storage.

Withdrawal capabilities must also be accompanied by firm capacity on the transporting pipeline(s) to be of any value as a reliable source of gas supply. Cascade's SGS-1 and LS-1 service requires TF-2 firm transportation service for storage withdrawals, and Cascade has sufficient firm TF-2 service to meet its storage daily deliverability levels.

Capacity Resource Options

Capacity options are either interstate pipeline transportation resources or capacity on Cascade's local distribution system. Cascade's local distribution system was built to serve the entire connected load in its various distribution service areas, on a coincidental demand basis, regardless of the type of service the customer may have been receiving. Cascade generally has the distribution capacity available to deliver the gas to customers if the pipeline delivers the gas to the Company's citygate stations. Core interruptible service relates to the spot market supplies and interruptible interstate pipeline transportation contracted to serve these markets. Cascade does not contract for firm supply or interstate transportation for these interruptible customers. Cascade's interruptible rates also reflect the fact that no firm supply or transportation services are purchased on behalf of interruptible customers.

As noted previously, available capacity exists on two of the three upstream pipelines serving the region: Spectra Energy's T-South Mainline from Northeast BC to the BC-Washington Border at Sumas, and TransCanada's GTN System that takes natural gas from Alberta at Kingsgate, Idaho and ships it to and through the region. The Company constantly reviews existing capacity options and works to negotiate contract terms that make sense for both parties, whenever we determine a project is viable.

Currently, five pipeline projects have been proposed by a variety of developers to serve the region: two to expand westward access to Rockies' production areas; three to enhance supply diversity within the region. These projects include:

- Blue Bridge Pipeline – Williams Gas Pipeline Company and Puget Sound Energy are the partners developing this project which will include the installation of additional compression horsepower at existing Northwest Pipeline stations and the construction of up to 172 miles of 30-inch pipeline and 16 miles of 36-inch pipeline. The project will deliver about 500 MMcf/d from Stanfield, Oregon to the I-5 Corridor and will generally follow Northwest Pipeline's existing pipeline corridor for the majority of the route.
- Inland Pacific Connector – Terasen Gas is proposing to build this 153-mile, 24-inch diameter pipeline as an extension of its Southern Crossing Pipeline from southern Alberta near Kingsgate, Idaho to Huntingdon, BC near Sumas, Washington. Initial capacity is projected to be about 350 MMcf/d.
- Palomar Pipeline (Cascade Segment) – Palomar Gas Transmission is a partnership between NW Natural and TransCanada. The proposed 212 mile, 36-inch-diameter underground pipeline will extend from TransCanada's GTN system near Madras, Oregon to NW Natural's system near Molalla, Oregon. It will be a bi-directional pipeline with an initial capacity of 1,200 MMcf/d.
- Ruby Pipeline - El Paso Corp. plans to apply to the Federal Energy Regulatory Agency in January 2009 to move forward with its 670 mile, 42-inch natural gas transmission pipeline beginning at the Opal Hub in Wyoming and terminating at a Malin, Oregon interconnect, near California's northern border. Initial capacity on the pipeline will be between 1,300 and 1,500 MMcf/d. As proposed, the pipeline will cross a portion of four states including Wyoming, Utah, Nevada and Oregon.
- Sunstone Pipeline – Project partners include Williams Gas Pipeline Company, LLC and TransCanada PipeLine USA Ltd. The proposed 585-mile, 42-inch diameter pipeline would transport up to 1,200 MMcf/d from the Rockies to markets in the West and Pacific Northwest. Pending approval, the pipeline will mostly parallel Williams' existing Northwest Pipeline (NW Pipeline) system from Opal Wyoming, through southern Idaho, and connecting with TransCanada's GTN system in Stanfield, Oregon.

Interstate Pipeline Transportation Services

Pipeline transportation resources are utilized to transport the gas supplies from the producer/supply sources to Cascade's system. Cascade currently purchases supplies from three different regions or basins: U.S. Rockies, British Columbia, and Alberta, Canada. Unless the gas supplies have been "bundled" by the supplier, these resources will require pipeline transportation to deliver them to Cascade's local distribution system.

Cascade has three long-term annual contracts with NWP, one long-term annual contract and three long-term winter-only contracts with GTN (including the upstream capacity on Trans Canada Pipeline), and one long-term annual contract with Sepctra in

British Columbia, Canada. These contracts do not include storage or other peaking services that provide additional delivery capability rights ranging from 9 to 120 days.

Cascade's utilization of pipeline transportation and peak day capacity for core and contracted for non-core firm transportation gradually changes over the planning horizon. Current company-acquired firm supplies utilize existing core firm transportation capacity. Future core market growth utilizes non-core firm transportation capacity that will be converted to core market firm transportation capacity as core market growth occurs.

Transportation resources historically have been purchased from the pipeline at the time of an expansion under long-term (twenty to thirty year) contracts. As a result, the Company may find that it has capacity excess to its core market needs, especially in the early years following an expansion. Since late 1989, Cascade has, through its Optional Firm Pipeline Capacity tariffs, allowed its non-core customers to utilize Cascade's firm pipeline capacity that is excess to current core customer requirements. By accepting all of the obligations associated with the underutilized pipeline capacity, the non-core customers have relieved Cascade's core customers of the costs associated with holding the pipeline capacity for future growth.

Additionally, pipeline capacity is a tradable commodity through the Electronic Bulletin Board (EBB). Should a utility have temporarily underutilized transportation capacity it can release that capacity to third parties. Such activities allow holders of pipeline capacity contracts to recoup a portion of the fixed costs incurred. The value of the capacity will fluctuate depending upon market conditions, however according to FERC rules, the capacity may not be released at a price above the max tariff rate of the interstate pipeline.

Any pipeline capacity in excess of core requirements for periods exceeding 30 days is offered to qualified buyers. The capacity is first offered to Cascade's customers, secondly to any broker, marketer or aggregator for service to Cascade customers and third to any broker, marketer or aggregator for service to non-Cascade customers. Absent a sale to these markets, the excess capacity is offered to any market through the respective pipeline's EBB.

As Cascade's customer count and loads continue to grow, the Company will need to acquire additional capacity resources. Some of the growth will result in the need for additional pipeline mainline capacity or alternatives to pipeline mainline capacity such as LNG satellite facilities located near or within the Company's distribution system. The Company is continuing to study the viability of LNG satellite facilities to meet these needs.

The Wenatchee lateral is an example where an LNG satellite facility may be more cost effective than the traditional solution of pipeline expansion for solving the upcoming capacity constraints on the lateral. Preliminary cost studies indicate that an LNG

satellite facility solution may be 1/3 to 1/2 the cost of a pipeline expansion project that would provide the same peak day incremental capacity.

Additionally, the load growth the Company is enjoying throughout much of its service areas is beginning to create the need to increase the physical capabilities of some of the pipeline's citygates. Even though Cascade may have an adequate amount of pipeline capacity available on the pipe, it may not have the contractual or physical capabilities at the citygate to meet the new load requirements. LNG satellite facilities or trucked in LNG re-gasification facilities or other similar type solutions may provide lower cost alternatives to the cost of city gate rebuilding projects. The Company will continue to study the viability of these alternatives.

Appendix E provides a summary of current and potential capacity resources evaluated during this planning cycle.

Supply Side Resource Uncertainties

Several uncertainties exist in evaluating supply-side resources. They include regulatory risks, deliverability risks, and price risks. Regulatory risks include the unknown impacts of future Federal Energy Regulatory Commission rulings that may impact the availability and cost of interstate pipeline transportation. Deliverability risk is the risk that the firm supply will not be available for delivery to the Company's distribution system.

Purchasing resources from larger producers or marketers who typically have gas reserves in multiple locations may minimize this risk. The risks associated with prices rising or falling during any winter period represents another supply-side uncertainty. To the extent the company purchases firm contracts that are tied to an index price, it may be at risk for paying more than was initially anticipated for the resource when the decision was made. Price risks associated with climbing prices can be minimized through the use of fixed price contracts or through the use of financial derivatives.

Financial Derivatives

Cascade constantly seeks methods to ensure ratepayers of price stability. In addition to methods such as long-term physical fixed price gas supply contracts and storage, another means for creating stability is through the use of hedges, or financial derivatives. The general concept is to lock-in a forward natural gas price with a hedge, consequently eliminating exposure to significant swings in rising and falling prices. Financial derivatives include futures, swaps, options on futures or some combination of these.

Natural gas futures contracts are actively traded on the New York Mercantile Exchange (NYMEX). The use of futures allows parties to lock-in a known price for extended periods of time (up to 6 years) in the future. Contracts are typically made in quantities of 10,000 dekatherms to be delivered to agreed-upon points (e.g., Sumas, Station 2, AECO, Northwest Pipeline Rockies, etc.). In a "swap", parties agree to exchange an index price for a fixed price over a defined period. In this scenario, Cascade would be able to provide its customers with a fixed price over the duration of the swap period. In

theory, the idea is to level the price over the long term. Futures and swaps are typically called “costless” because they have no up front cost.

Unlike futures and swaps, an option on futures only provides protection in one direction—either against rising or falling prices. For example, if Cascade wanted to protect itself against rising gas prices but keep the ability to take advantage of falling prices, Cascade can purchase a “call” option on a natural gas future contract. This arrangement would give the Company the right (but not the obligation) to buy the futures contract at a previously determined price (“strike price”). Similar to insurance, this transaction only protects the company from volatile price spikes, via a premium. The premium is typically a function of the variance between the strike price compared to the underlying futures price, the period of time before the option expires, and the volatility of the futures contract.

Portfolio Purchasing Strategy

Cascade’s Gas Supply Oversight Committee (GSOC) oversees the Company’s gas supply purchasing strategy. Beginning with the 2004/05 gas supply portfolio, Cascade has employed a more rigorous gas procurement strategy for both physical gas supplies and for hedging the price of the core portfolio. Cascade has contracted for physical supplies for up to five years (based on a warmer-than-normal weather pattern). The Company’s current gas procurement strategy is to have physical gas supplies under contract for 100% of year one’s warmer than normal core needs, 80% of year two, 60% of year three, 40% of year four and 20% of year five. This strategy results in the need to contract annually for approximately 20% of the core portfolio supply needs for the upcoming five-year period.

Currently, the Company is moving towards a more seasonable approach versus securing annual, baseload contracts. In addition, based on current market conditions, the Company is not locking in new long term supplies during the summer months. This allows us to take better advantage of pricing opportunities regardless of basin.

The Company’s ongoing hedging strategy is to lock in prices in a manner such that roughly 30% of the gas supply portfolio contains locked-in prices for three years, another 30% is locked in for two years, another 30% is locked in for one year, and the remaining 10% will be at index pricing. Fixed prices will consist primarily of financial derivatives with institutions (financial swaps), but may also include some locked-in prices for physical supplies. This hedging strategy results in the need to annually hedge approximately 30% of the core portfolio needs for the upcoming three-year period.

The Company is utilizing a programmed buying approach for locking in or hedging gas supply prices. For the 2008/09-contract year, Cascade locked in prices with banks and/or suppliers during three specific time periods (Spring, Summer, and Fall). Ideally, the periods are designed so that each pricing basin (Sumas, Rockies, AECO) has financial swaps in each of the three buy periods. Typically, financial swaps are contracted in amounts in standard blocks of 10,000 dths. While it is possible to

contract for other amounts, deviating from the standard blocks could potentially result in having to pay a premium as it is harder for the financial institution to hedge that odd amount with one of their counterparties. As a relatively small LDC, Cascade's ability to hedge in standard blocks is severely limited. Dividing the blocks into numerous smaller or odd sizes would incur increased transactional costs. In fact, some institutions will not even consider executing a swap that has varying volumes or are of a non-standard size. Consequently, Cascade's hedging periods are designed with these concerns in mind while trying to ensure that the total notional volume to be hedged is spread as equally as possible across the three buy periods. Utilizing the consistency of a programmed buying method as described above should help ensure that any locked-in prices provide stability over time, in addition to preventing Cascade from being over or under hedged. In the 2009/10 contract year and beyond, Cascade plans to annually review our gas procurement physical and hedging strategy and, if unchanged, the company would continue its physical and hedging strategies as outlined above. In light of current market conditions and the tight credit concerns, the company will be continuously evaluating our hedging strategy.

Cascade believes its gas procurement strategy is achieving diversity and flexibility in its gas supply portfolio through a combination of physical and financial structures. This goal encompasses not only supply basin origination and capacity limitations, but also includes a combination of pricing options that will assist Cascade in minimizing exposure to price volatility. The programmed buying approach to locking in a significant portion of gas prices maintains a market sensitive and balanced supply portfolio that continues to represent stable pricing as well as secure physical supplies for the Company's core customers.

Section 7
Resource Integration

Resource integration is the last step in Cascade's IRP process. It involves finding the least cost mix of demand and supply side resources given the forecasted load requirements of the core customers. The tool used to accomplish this task is a computer optimization model known as SENDOUT®. This model permits the Company to quickly develop and analyze a variety of resource portfolios to help determine the type, size, and timing of resources best matched to forecast requirements. SENDOUT® is very powerful and complex. It operates by combining a series of existing and potential demand side and supply side resources and optimizes their utilization, at the lowest net present cost over the entire planning period, for a given demand forecast.

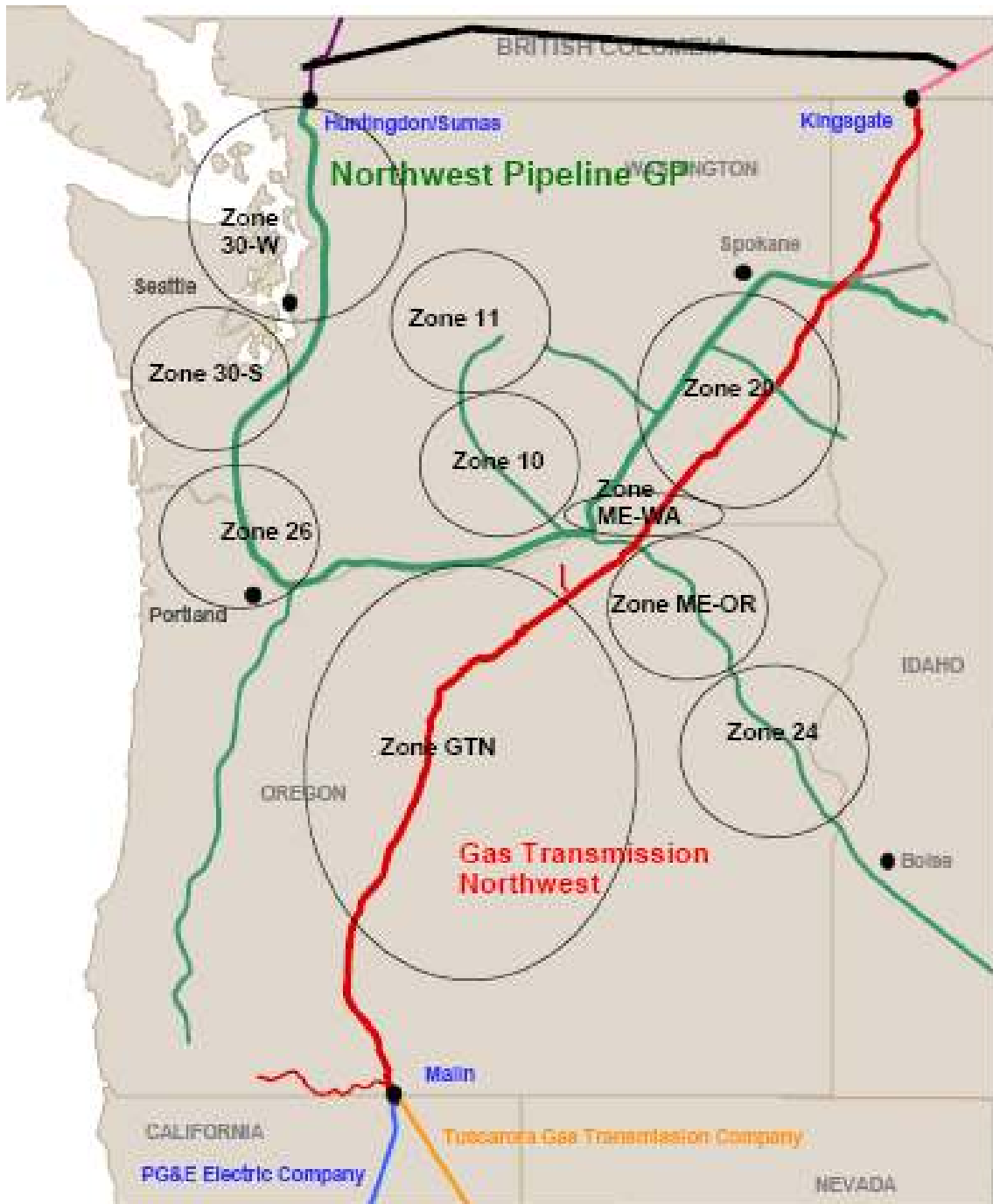
Resource Optimization Analysis Tools

SENDOUT's broad capabilities allow the Company to develop supply and demand relationships that closely mirror Cascade's existing operations. One of the significant enhancements in this year's IRP is that demand areas are now broken down by the various pipeline zones, as opposed to the two basic demand areas utilized in past IRPs. A copy of the network diagram is shown in Figure 7-A on the following page. These demand centers reflect on a daily basis, the aggregate 20 year load forecasts of all Cascade's core market customers being served from either Northwest Pipeline GP (NWP) or Gas Transmission Northwest (GTN) interstate pipeline facilities. Individual transportation segments, storage, supply and demand side resources, both existing and potential, are targeted to these pipeline zones. This level of precision allows SENDOUT® to consider each resource on an individual basis within the portfolio while also recognizing where physical system limitations exist. Resource characteristics such as a supply contract's daily delivery capability, minimum take requirements, maximum daily transport capability by individual segment, and storage inventory limitations and withdrawal and injection curve characteristics can be part of each resource's basic model inputs. The ability to model resources in this fashion allows SENDOUT® to tailor its optimization within envisioned constraints and ensures that the model's optimal solution can work under anticipated operating conditions.

However, because SENDOUT® utilizes a linear programming approach, its results are considered "deterministic". For example, the model knows the exact load and price for every day of the planning period based on the analyst's input and can therefore minimize costs in a way that would not be possible in the real world. Therefore, it is important to acknowledge that linear programming analysis provides helpful but not perfect information to guide decisions.

Since decisions are made in the context of uncertainty about the future, in 2006 Cascade purchased VectorGas™. VectorGas™ was an add-in product to the SENDOUT® model that facilitates the ability to model gas price and load uncertainty (driven by weather) into the future. VectorGas™ utilizes a Monte Carlo approach in combination with the linear programming approach in SENDOUT®. The VectorGas functionality was integrated in the SENDOUT software with Version 12.5 which is the platform that Cascade prepared its integration analysis. The addition of the monte-carlo modeling capability provides

FIGURE 7-A



additional information to decision makers under conditions of uncertainty. This tool will prove a valuable enhancement to the robustness of the Company's long-term resource planning and acquisition activities.

Scenarios versus Simulations

Prior to discussing the modeling process, inputs, and ultimately the results of the analyses, a brief discussion of the term scenarios versus simulations is necessary. As stated earlier, SENDOUT relies on a series of inputs or assumptions and then solves for the least cost solution based on the information provided to the model. Each group of assumptions is considered a scenario. For example, the company models medium load growth under average weather conditions where the assumed daily weather pattern is input into the SENDOUT model. The company also runs scenarios utilizing the low and high growth forecasts and historically has run several different price assumption scenarios. The results of each of these scenarios provide an answer or a least cost solution, which the optimization model has solved based on its perfect knowledge. Historically, this has provided the range of expected outcomes. However, with the addition of the Monte-Carlo functionality, the company can now run simulations to determine if the scenario results are reasonable and to provide an expected range of results based on a statistical analysis.

Table 7-1 provides the list of scenarios included in this IRP and their key assumptions. To assess the impacts due to variations due in pricing and weather the company ran Monte-Carlo simulations on the Basecase scenario. The company utilized the Basecase scenario as it represents the scenario Cascade considers most likely to be experienced over the planning horizon. In addition to the 200 draws, the Company prepared several sensitivity scenarios to test the resource selections when the baseline conditions were changed. Table 7-2 below describes those sensitivity scenarios.

Decision Making Tool

Analysis of optimization model results and other operational and contractual constraints allows Cascade to make more informed resource decisions. The IRP optimization model output and Monte-Carlo simulation analysis will provide the quantifiable output from numerous model inputs. The model does not prescribe the ultimate resource portfolio. It can only determine the least cost set of resources given their specific pricing and quantifiable constraint characteristics. However, there are many other combinations of resources that may be available over the planning horizon. Cascade must still make subjective risk judgments about unquantifiable and intangible issues related to resource selections. These will include future flexibility, supplier deliverability risk, pipeline(s) risk, financial risk to the utility and its ratepayers, operational constraints, regulatory risk, etc. The risk judgments are combined with the quantitative IRP analysis to form actual resource decisions.

**TABLE 7-1
2008 IRP Scenario Analyses**

Scenario Name	Key Assumptions
Basecase	Medium Load Growth, Medium Gas Price Forecast, Average weather with Peak Event
High Growth	Strong Economic Growth result in High Load growth, Average Weather, Medium Gas Prices
Low Growth	Economic Conditions result in Low Load growth, Average Weather, Medium Gas Prices
Basecase Limited Canadian Imports	Model restricts Canadian imports to 80% of the basecase levels.
Basecase No Rockies price advantage	All potential incremental resources were priced at NYMEX with no basis adder.
Environmental Externalities Scenario 1	Medium Load Growth, Average Weather, Assumes Carbon Cost Adder Implemented in 2010 for CO2 emissions at \$12/ton ramping up to \$36/ton over a 5-year period
Environmental Externalities Scenario 2	Medium Load Growth, Average Weather, Assumes Carbon Cost Adder would be applied to 50% of LDC's CO2 emissions. Assumed 2012 implementation. Costs \$30/ton ramping up to \$90/ton over a 5-year period
Environmental Externalities Scenario 3	Medium Load Growth, Average Weather, Assumes Carbon Cost Adder would be applied to 75% of LDC's CO2 emissions. Assumed 2015 implementation. Costs \$30/ton ramping up to \$90/ton over a 5-year period

**TABLE 7-2
2008 IRP Sensitivity Scenarios**

Scenario Name	Key Assumptions
Basecase No Blue Bridge	Blue Bridge is removed as a potential resource; however Sunstone, imported LNG, bio-mass, satellite LNG, and conventional supplies remain.
Basecase No Sunstone	Sunstone is removed as a potential resource; however Bluebridge, imported LNG, bio-mass, satellite LNG, and conventional supplies remain.
Basecase Pacific Connector	Pacific Connector Pipeline and imported LNG are added as potential resources; however Sunstone, Blue Bridge, bio-mass, satellite LNG, and conventional supplies remain.
Basecase Palomar	Palomar Pipeline and imported LNG are added as potential resources; however Sunstone, Blue Bridge, bio-mass, satellite LNG, and conventional supplies remain.
Basecase Ruby Pipeline	Ruby Pipeline is added as a potential resource; however Sunstone, Blue Bridge, imported LNG, bio-mass, satellite LNG, and conventional supplies remain.

Key Inputs**Demand Forecast Items & Weather Assumptions**

The optimization process compares a portfolio of resources against a specific demand requirement. SENDOUT® generates a daily demand forecast by combining base load and temperature sensitive usage factor inputs with a specified daily temperature pattern input. As previously mentioned, this is an area where the company enhanced its modeling by developing usage factors for each of the NWP zones which in prior IRP's had been considered on an aggregate basis. The company continues to have one demand center on GTN, which is utilized to meet Cascade's Central Oregon load. In order to develop the temperature sensitive usage factors on a zone by zone basis, the company reviewed pipeline deliveries for the 2004 through 2007 period and developed monthly use per customer per degree day factors. The annual customer growth rates from the low, medium and high forecasts discussed in Section 3 were developed for each of the NWP zones and were applied to 2007 monthly core customer counts. Weather patterns for each of the zones were developed based on 5 distinct weather areas. The weather areas and their applicability to each of the zones is shown in Appendix B-1.

Prior to the 2007 IRP, the company had developed daily temperature patterns to estimate the impact of weather ranging from warmer than normal to design conditions, with the expected portfolio being one with average weather. The average weather pattern historically had been based on the 20 year average excluding the high/low annual degree day totals to develop an annual total for each area. These totals were then allocated to the daily readings based on the 90/91 winter pattern since that was the most recent year in the company's weather history with a peak day reading of 61 dds. However, with the ability to run Monte-Carlo simulations, the company developed its "average" weather pattern based on the company's 60+ year weather history, and the expected degree days for each month. The average pattern for each area was approached on a month-by-month expected value and then the degree days were allocated within the month based on the past years' average daily distribution. Since a peak event can occur in an otherwise normal weather year, the average weather scenario includes one 3-day peak event, which includes a design day reading of 61 degree days system wide.

Demand Side Alternatives

For purposes of this IRP, the Company has utilized the annual achievable potential schedule shown on Table 5-9 in section 5 as an input to the optimization model. Due to the revisions in the modeling approach to show demand by zone, conservation has been treated as a "must-take" supply alternative available at the pipeline citygate level. For purposes of modeling, 80% of the identified Oregon Conservation resources are assumed to occur on the GTN pipeline with the remaining 20% occurring on Northwest pipeline. Washington conservation was modeled as a must-take resource at the NWP citygate. Because the acquisition of DSM is dependent upon a number of small purchases, determining which pipeline zones will procure the most conservation at this point is premature. In future planning cycles, the company will review the results of the participation levels and determine if more detailed assumptions on conservation acquisition can be modeled. Under the basecase scenario the company has assumed

that conservation resources could be purchased, on a levelized cost per therm basis of \$6. The cost per therm figure of \$6 is an estimate of the combined Total Resource Cost for the all measures included in the program, including program delivery and administration costs.

Supply Side Resource Alternatives

For modeling purposes, supply side alternatives are grouped into one of three categories, gas supply, storage facilities, or pipeline transportation. As discussed in section 6, some of the supply alternatives include one or more of these categories. For example, a gas supply resource may be delivered at Cascade’s citygate, essentially reducing the requirement for firm pipeline capacity. A satellite LNG facility (whether trucked in or liquefied on site) located within Cascade’s distribution system can reduce the need for pipeline capacity on a peak day as the supplies will be available to be directly flowed into Cascade’s local system. The following table provides a high level summary of the resource alternatives considered over the planning horizon.

Table 7-3

Supply Side Alternatives Modeled

Resource	Scenario Considered
Conventional Gas Supply Contracts with annual, seasonal or winter only characteristics delivered to Northwest Pipeline & GTN Systems	All
Conventional Gas Supply Peaking Contracts Delivered to Northwest Pipeline & GTN Systems	All
Gas Supply Peaking Contract delivered to Cascade's citygates	All
LNG Import Supplies Delivered to Northwest Pipeline System	All
Satellite LNG Storage within Cascade's distribution sytem	All
Unconventional Supplies (BIOGAS) available within Cascade's distribution sytem	All
Additional Pipeline Capacity secured through medium--long term capacity agreements	All

Natural Gas Price Forecast

Price volatility has become an on-going factor in the natural gas industry since 2005. Prices in the natural gas market have continued to be volatile. Prices started climbing in January 2008 and kept rising through the spring and early summer, even though historically prices tend to decline after the end of the heating season. However, as of the time of this writing, the market prices have dropped by more than 50% from a high of \$13.00 in early July 2008. Demand, oil price volatility, the global economy, electric generation, opportunities to take advantage of new extraction technologies, hurricanes and other weather activity will continue to impact natural gas prices for the foreseeable future. It is impossible to accurately predict what future natural gas prices will be. However, Cascade has considered price forecasts from several sources, such as Woods Mackenzie, Energy Information Agency, the Texas Comptroller’s forecast, as

well as our observations of the market to develop our low, base and high price forecast. Details of our price forecast can be found in Appendix E. The company compared the monte-carlo price simulation results to the low, base and high forecasts and found that the 200 draws captured the same range of pricing outlined in the forecasts shown in the Appendix. Therefore, individual deterministic runs under the low and high price forecast were not run.

Integration Results and Key Findings

As described earlier in this section, Cascade performed eight different scenarios. The results are summarized below. However, it should be noted that the results of these analyses should be considered broadly. Like all analyses, the results of the resource optimization models are dependent upon the input assumptions provided. Scenario and Monte-Carlo analysis help by providing information on the ranges of input assumptions. Whether Cascade eventually secures these particular resources, acquires ones of comparable size and characteristics, or decides on an alternative approach is subject to ongoing resource investigation and evaluation activities. Specific resources made available to the model at this time may or may not be physically available at the time they are needed nor economically attractive in comparison to alternatives that may become available in the future. Therefore, prior to securing any of these resources, additional analyses of the specific resource must be completed.

The results of the eight scenarios are fairly consistent and reveal the following general trends:

- The basecase results indicate energy efficiency programs with a levelized cost of 76 cents per therm or less are cost-effective over the planning horizon, with the price uncertainty analysis indicating that the levelized costs will likely range between 69 to 85 cents per therm. However, if a carbon cost adder was established during the planning horizon similar to those described in Section 5, the cost-effectiveness limits could increase between 28 to 46 cents depending upon the level of the carbon adder and the timing of its implementation. As discussed in Section 5, Cascade uses a levelized cost of 85 cents per therm in its conservation analysis, which the company believes is still appropriate in light of the uncertainties surrounding carbon legislation over the planning horizon. Although some measures in the conservation stack may exceed the cost-effectiveness threshold, the overall conservation program will remain cost-effective.
- Even with energy efficiency programs, Cascade will need to acquire additional capacity resources to meet anticipated peak day requirements, due to Cascade's continued growth in its residential and commercial customer base. A number of Cascade's existing transportation agreements will expire over the next several years. In most cases, Cascade has the unilateral right to extend or cancel the expiring contracts upon one year's notice. As a result, the company will have the opportunity to review alternatives to extend or replace those contracts.

- In all scenarios, Sunstone was selected to meet Cascade's pipeline capacity shortfall, starting in 2011. Sunstone allows Cascade to move Rockies supplies to the Pacific Northwest, and combined with incremental transportation on GTN, will address capacity shortfalls. As a result, Sunstone will provide supply diversity to Cascade's customers in Oregon, who have been traditionally served for the most part with natural gas supply from Alberta. Additionally, Sunstone combined with Blue Bridge pipeline provides the means to bring more Rockies supplies to the I-5 corridor. It should also be pointed out that we did conduct a sensitivity analysis to see if the model would take Blue Bridge without Sunstone. The model did not select Blue Bridge in this instance.
- A small volume of bio-gas appears to be a potential resource to assist in addressing shortfalls in zones 10 and/or 11 (the Wenatchee lateral). Assuming any gas quality issues are satisfactorily addressed, bio-gas could also eliminate or reduce distribution system constraints.
- Satellite LNG facilities located within Cascade's distribution system may also be an attractive alternative to incremental pipeline capacity in areas where physical limitations at the gate stations would result in even higher costs associated with a pipeline solution. There may be additional advantages to such a strategy to the extent a facility could be strategically located on a portion of the distribution system that will eliminate or reduce distribution system constraints.
- Imported LNG at Kitimat appears to be another potential source of additional supplies beginning in 2012. Many of the proposed LNG import facilities in the Pacific Northwest would require backhaul capability or additional infrastructure on upstream pipelines in order to reach Cascade's distribution system. However, imported LNG at the Kitimat facility would be transported along existing right-of-ways belonging to Pacific Northern Pipeline, which connects to Westcoast's system. Cascade then could use its existing Westcoast transport to move the supplies to Cascade's service territory.
- As indicated above, imported LNG from Kitimat was selected as part of our portfolio mix. However, on September 19, 2008, Kitimat LNG announced that the development focus of the facility would switch from a regasification to a liquefaction facility. Therefore, Kitimat would become an exporter, not an importer of natural gas. While Kitimat did indicate that a regasification facility might still be built at some point; as of this writing, it would appear that with this change of direction, the likelihood of LNG imports from British Columbia has declined considerably. Instead, this change in facility development points to the probability of less British Columbia gas being exported to the United States. We believe this creates an even greater need to enhance supply diversity, and develop the necessary infrastructure to deliver that supply to the Pacific Northwest. The other proposed LNG import facilities, will require incremental transportation via NWP or GTN. The Company has insufficient information available as to the likelihood and costs associated with

acquiring additional transport capability to move supplies from the proposed Northwest facilities to Cascade's distribution system.

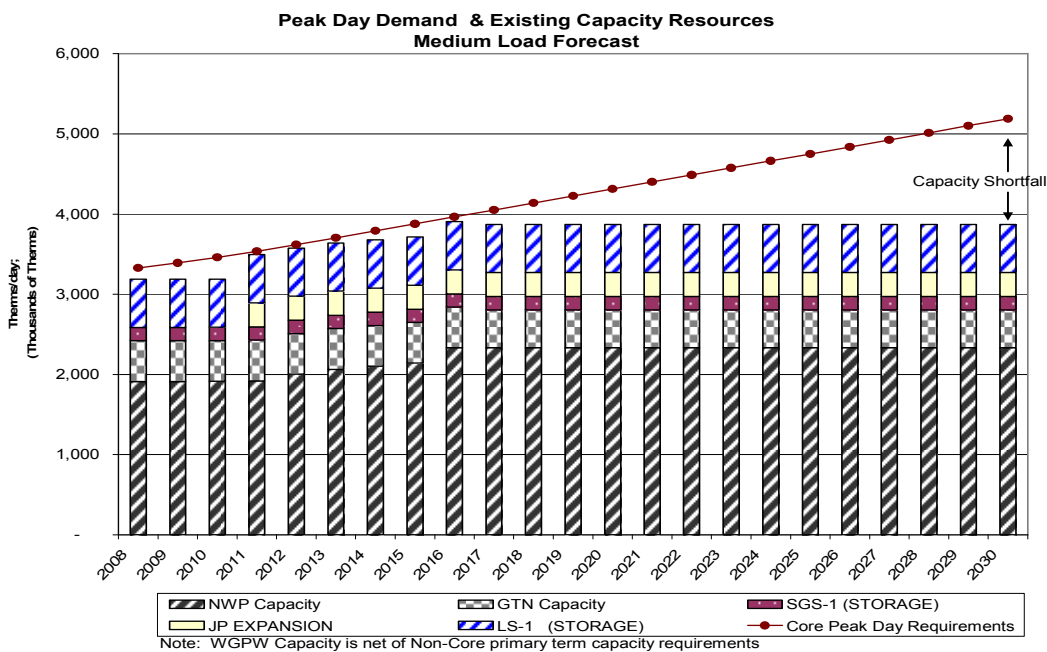
- We considered the impact of possible reductions in exports of gas supplies physically produced in British Columbia and Alberta, by limiting the amount of physical Canadian supplies that could be exported via existing infrastructure at Station 2, Sumas or AECO to 80%. Under this scenario, the model chose to increase the amount of imported LNG at Kitimat. In light of the recent announcement by Kitimat discussed above, the company will have to re-analyze the impact of this new event, as well as consider other imported LNG options.
- In response to the Kitimat announcement indicated earlier, we considered the possible addition of two other LNG sources. A scenario was developed to move LNG from the proposed Bradwood Landing facility, connecting to Palomar Pipeline and ultimately delivered to Madras OR where it would flow on incremental GTN capacity to serve Central OR. When SENDOUT was given the option to flow Sunstone or this Palomar scenario, the model continued to select Sunstone. At this time, it is uncertain whether or not the facility at Warrenton will be put into service. Further complicating this issue is the likelihood that it is unclear whether GTN will provide backhaul capability. It appears the infrastructure required to provide that firm backhaul service on GTN coupled with the transport from the facility makes this scenario appear to be undesirable, given other potential options.
- Similarly, we looked at considered transporting LNG from Jordon Cove via Pacific Connector Pipeline and then backhauling supplies on GTN to serve Central OR. As indicated above. Again, this scenario is complicated because it is unclear whether GTN will provide backhaul capability. It appears the infrastructure required to provide that firm backhaul service on GTN coupled with the transport from the facility makes this scenario appear to be undesirable, given other potential options.
- We also considered moving Rockies supplies to Malin via Ruby Pipeline and then backhauling supplies on GTN to serve Central OR. As was the case with transporting LNG from the Oregon coast, the model, when given the option of utilizing Sunstone and capacity on GTN, chose Sunstone over Ruby. In the absence of Sunstone, Ruby was selected over the LNG options described above.
- 20 year portfolio costs on a Net Present Value (NPV) basis, are expected to range between \$3,309,990,000 to \$3,492,950,000 for the planning period, with an average cost per therm ranging between \$.4544 and \$.4662.

Peak Day Planning Results

Figure 7-B shows the projected peak day requirements compared to the company's existing capacity resources under the medium load growth forecast. This same comparison was completed for both the high and low load growth forecasts and results of

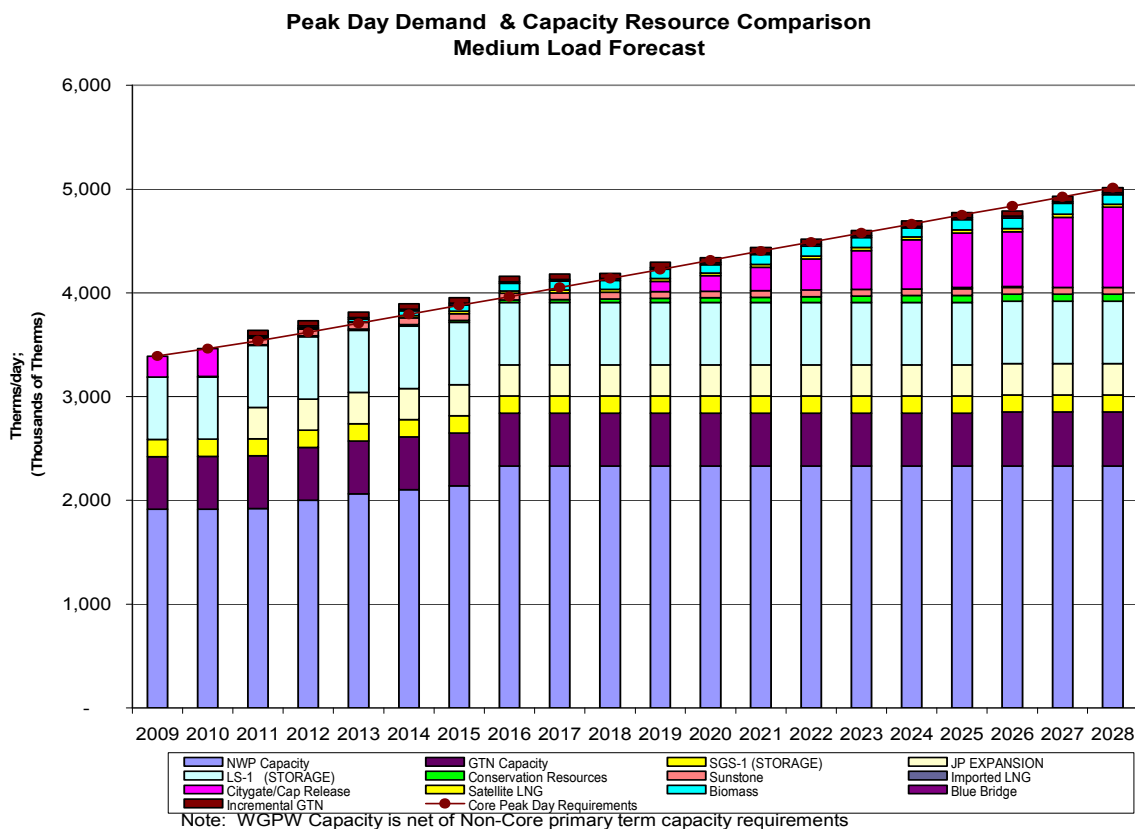
the zone by zone analysis are included in Appendix F. Under all growth scenarios, the company will require incremental peak day delivery in order to meet Cascade’s anticipated peak loads located on the Northwest Pipeline system as soon as the 2010/2011 heating season. This shortfall results from the expiration of a leased storage agreement that will end in April 2007. As discussed in Section 6, the company has acquired incremental Jackson Prairie storage inventory and withdrawal capability through the participation in the JP expansion open season, which took place during early 2006. The Company has also entered into a companion transportation agreement with Northwest Pipeline for the transportation to deliver the stored supplies under this agreement to Cascade’s service territory. In the interim, Cascade will meet its peak day requirements with citygate peaking resources

Figure 7-B



For modeling purposes, the company included several capacity alternatives to meet peak planning needs. Based on the analysis, peak day requirements will be met through a blend of resources. For purposes of the graphical depiction, the company has shown the incremental conservation resources as a capacity resource. As shown in Figure 7-C, incremental pipeline capacity on NWP along with a combination of citygate peaking, imported LNG, bio-gas, and satellite LNG alternatives will be used to meet growing peak requirements.

FIGURE 7-C



Annual Load Requirements and Weather Uncertainty

The annual load requirements will vary dramatically based on the weather assumptions. Through the use of SENDOUT’s monte-carlo functionality, the company has the ability to analyze the impacts of weather on its load forecast. Figure 7-D shows the overall expected range of the load forecasts, before considering load reductions that can be achieved through incremental conservation programs. The chart provides the upper parameter, which is based on the assumption that the high load growth forecast occurs, with the lower parameter occurring under the low load growth forecast. Capturing the uncertainty around the medium load growth forecast was done with ‘. The monte-carlo simulation performed 200 draws, with each draw calculating the monthly load based on the weather as randomly determined by the model for each of the weather zones. Figure 7-E provides a more in depth look at the medium scenario results. The absolute maximum and absolute minimum amounts depict the minimum or maximum system demand from the 200 draws for a particular year. The absolute maximum/minimum does not represent any single results for the 20 year planning horizon.

Figure 7-D

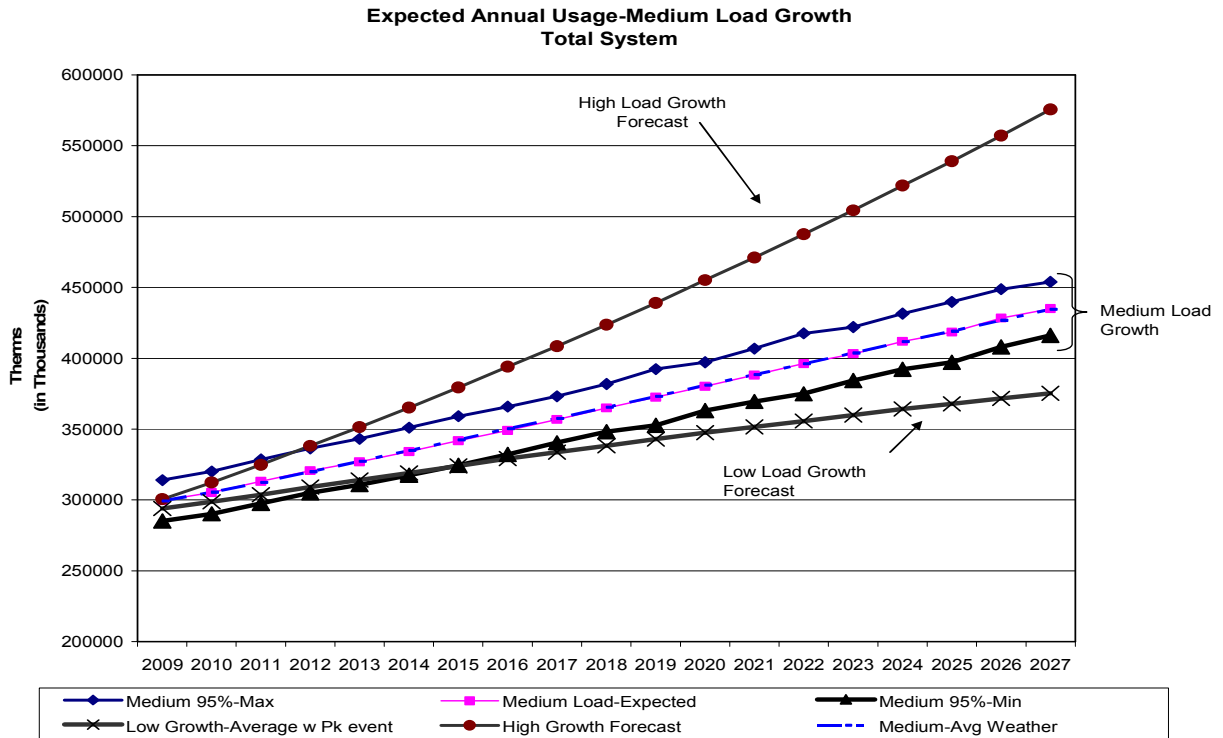
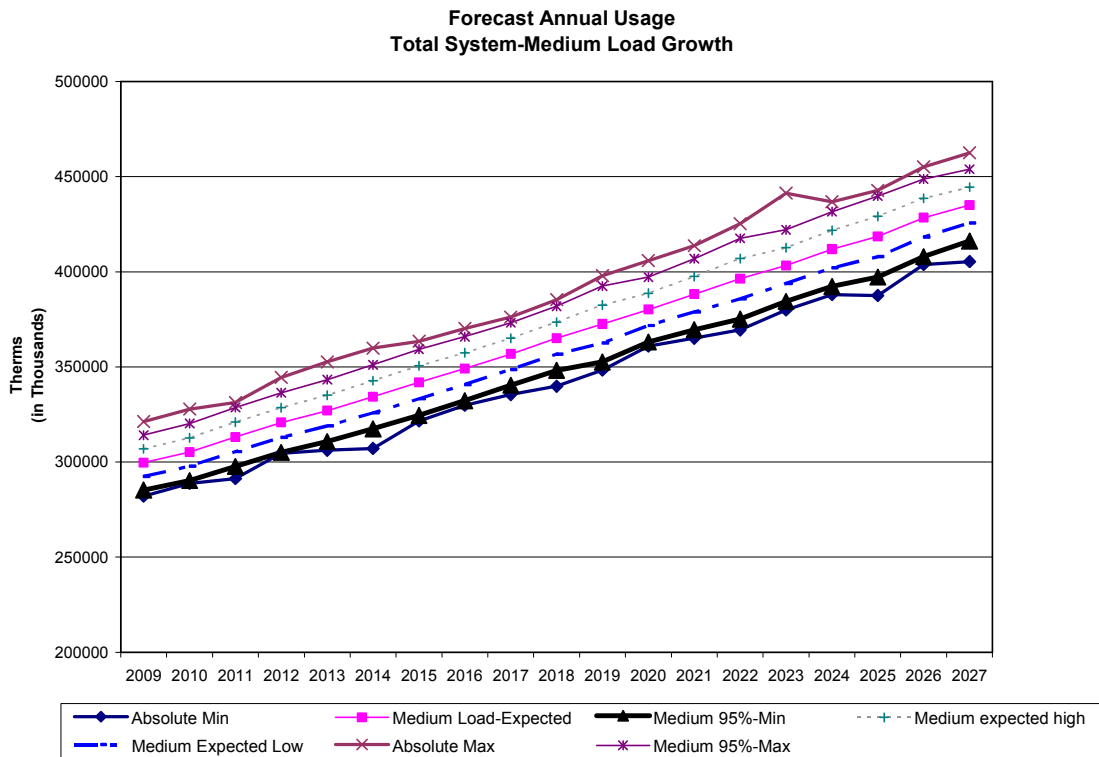


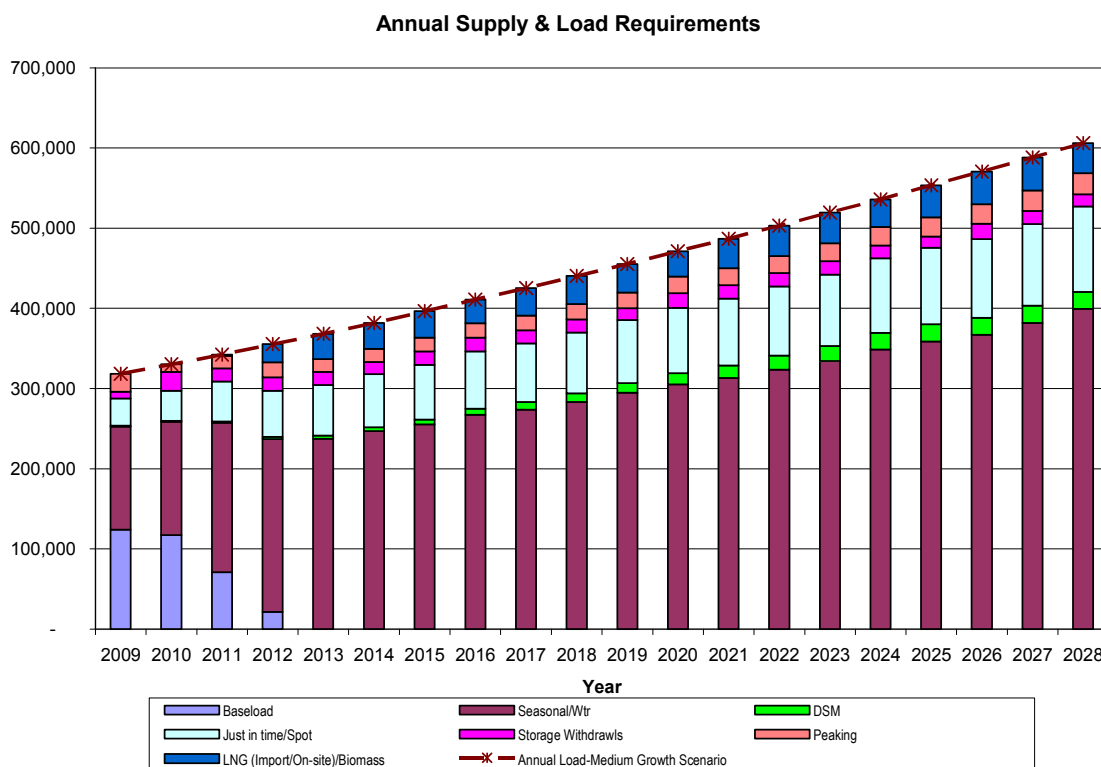
FIGURE 7-E



Additional tables and graphical analyses summarizing the weather and its impact on the annual load forecast are included in Appendix G-1.

To meet this demand, the company will need to acquire a blend of gas supply and conservation resources. For purposes of this plan, the company has estimated the level of conservation that is achievable over the course of the planning horizon which was discussed at length in Section five. Figure 7-F shows how the company anticipates meeting the projected load over the planning horizon under the basecase scenario. Variations in the portfolio in order to meet actual load requirements during any year will occur primarily through the purchase of just-in-time, or spot gas purchases.

FIGURE 7-F



Impacts of Price Uncertainty and Overall System Costs

The ability to accurately forecast long-term gas prices is influenced by two different types of uncertainty: uncertainty related to long-term changes in the industry and uncertainty related to short-term gas price variability. Contributing to long-term uncertainty are long term supply and demand issues, including growth in demand for electric generation, changes in LNG import infrastructure, possible pipelines to bring Alaskan and other frontier gas supplies to market. Short-term price variability also affects the long-term predictability of gas prices. Even if long-term supply and demand outcomes are exactly as projected, actual prices in future months will still reflect variability due to short-term

market conditions. In order to estimate this uncertainty, the Company utilized SENDOUT's Monte-Carlo functionality, to analyze the impacts of price on the portfolio costs. Since natural gas is becoming more of a national market the company believes that volatility in the NYMEX prices will have a far larger influence on the portfolio's price volatility compared to the volatility in the AECO, Sumas and Rocky Mountain basin differentials. Figure 7-G shows the overall expected range of the NYMEX prices over the planning horizon. The absolute maximum and absolute minimum amounts depicts the minimum amount or maximum amount from the 200 draws for a particular year. The Absolute maximum/minimum does not represent any single draw result for the 20 year planning horizon.

FIGURE 7-G

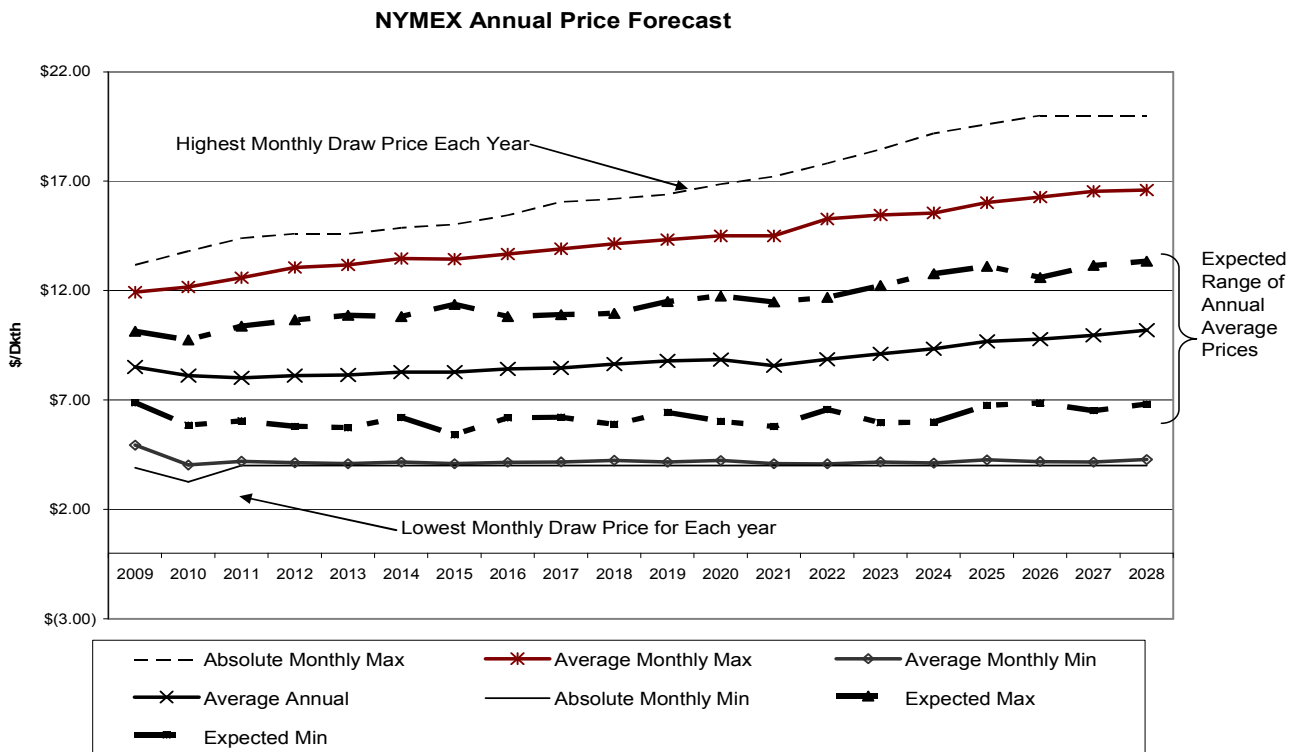
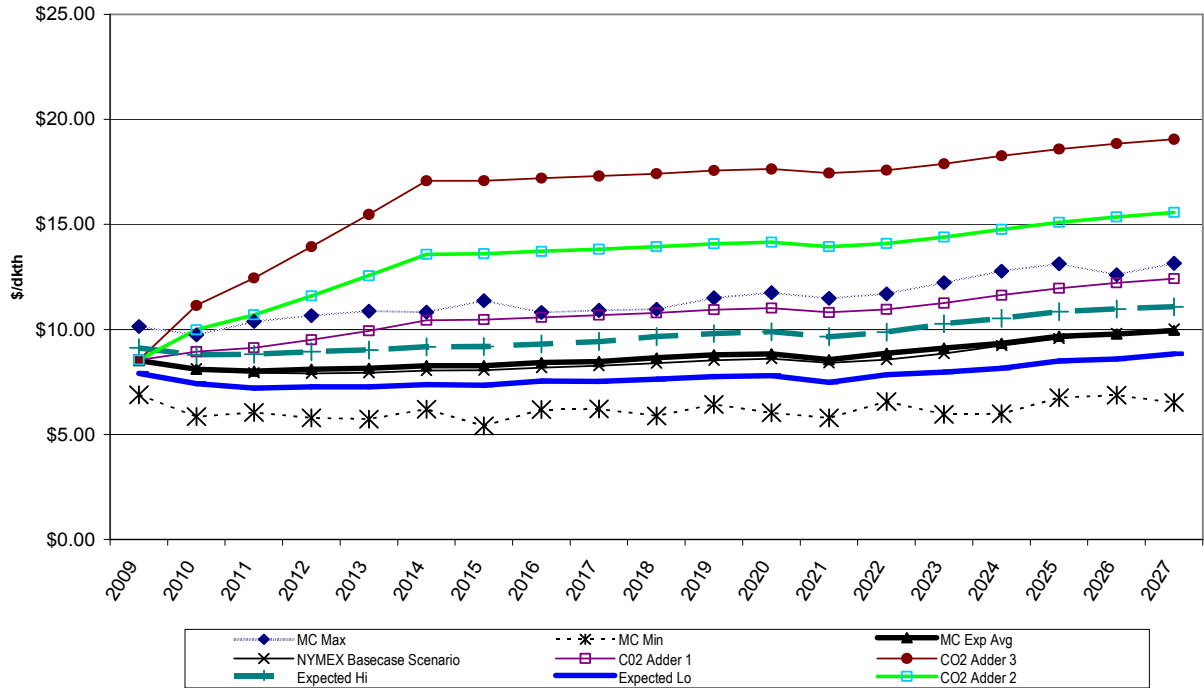


Figure 7-H compares the expected range of NYMEX prices from the Monte-Carlo analysis including the Environmental Externality costs that were discussed in Section 5. The highest anticipated NYMEX prices would result if the Scenario 3 Carbon Cost Adder was implemented in 2010. Under that scenario, the \$3.01/dkth tax would ramp up over a 5-years and by 2014 the tax would be \$9.03/dkth. The impact of the price volatility on the overall cost of the long-term portfolio is shown below in Figure 7-I. Further tables and graphical analyses summarizing the pricing simulations are included in Appendix G-2.

**FIGURE 7-H
PRICE FORECAST-NYMEX
Average Annual Price**



**FIGURE 7-I
Annual Portfolio Cost**

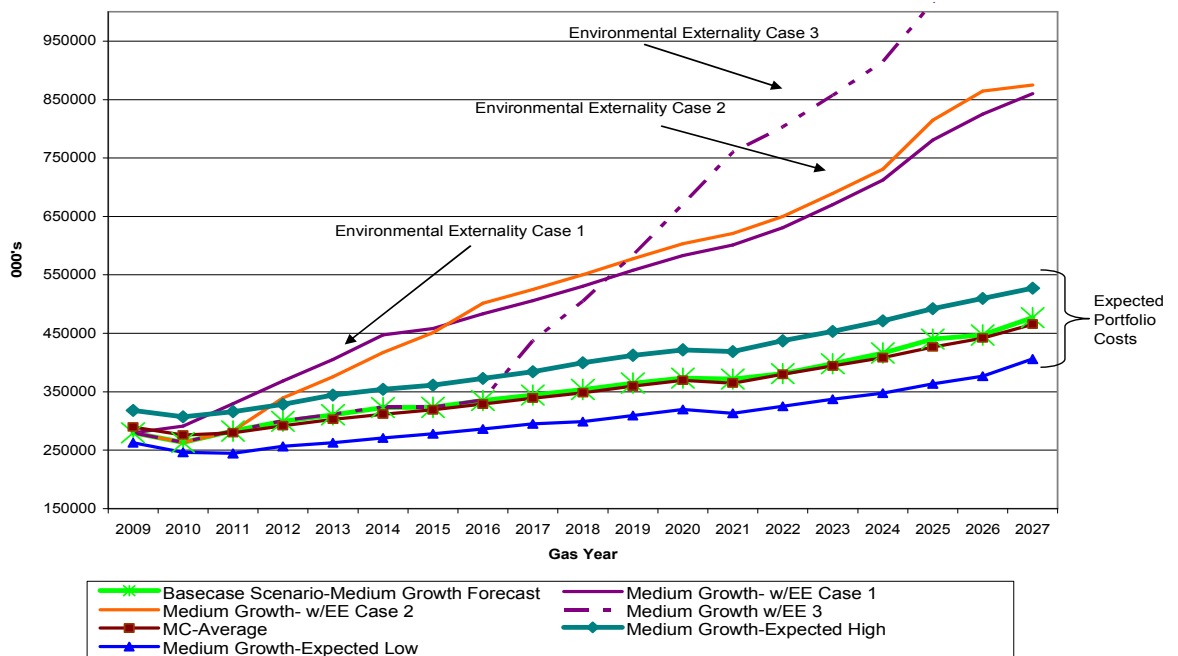


Figure 7-J shows a histogram of the total portfolio cost for all 200 draws, plus the Company’s basecase results. The histogram depicts the frequency the total cost of the portfolio occurred among all the draws, the mean of the draws, the standard deviation of the total costs, as well as the total costs from the Company’s Basecase scenario. The figure shows that the Company’s Basecase is within an acceptable range of total costs based on 200 unique pricing and weather scenarios.

Figure 7-J

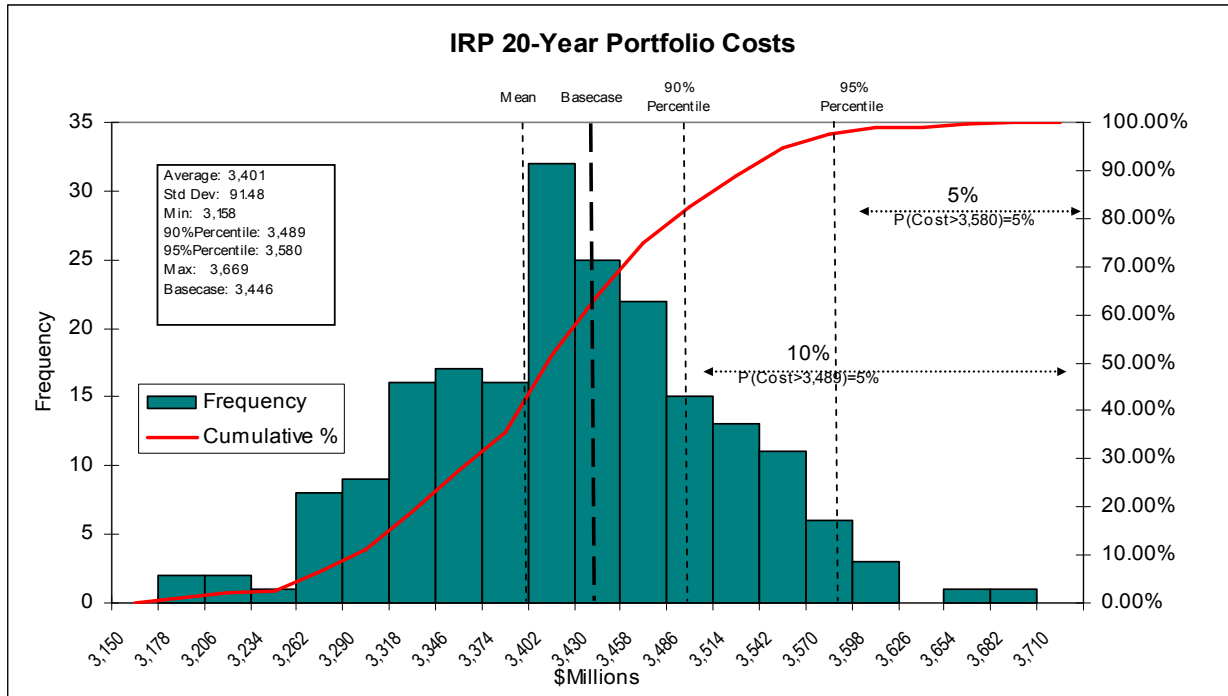


Table 7-4 on the following page summarizes the Net Present Value of the 20-year portfolio costs and average cost per therm for each of the scenarios and includes the anticipated range of costs from the monte-carlo modeling.

Cascade’s avoided cost estimates represent the marginal cost of natural gas usage incremental to the forecasted demand. In other words, avoided cost is the unit cost to serve the next unit of demand during any given period of time. If demand-side management measures reduce customer demand, the Company is able to “avoid” certain commodity and transportation costs. This concept is important to assessing the proper value to demand-side management efforts. Based on the annual costs from the basecase scenario, the Company has estimated that the avoided costs are \$13.20 for 30-year measures and the cost-effectiveness limit is 76 cents per therm. Results from the monte-carlo modeling indicate that the cost-effectiveness limits for conservation measures would range between 69 and 85 cents per therm. Additional information regarding the calculation of these avoided cost estimates is included in Appendix H.

TABLE 7-4

	NPV 20-Yr Portfolio Costs in \$000's	Average Cost Per Therm
Scenario Results:		
Basecase Scenario	\$ 3,446,870	\$ 0.4680
High Load Growth	\$ 4,119,026	\$ 0.4711
Low Load Growth	\$ 3,214,534	\$ 0.4741
Basecase w/Limited Cdn Exports	\$ 3,506,456	\$ 0.4761
Basecase--No Rockies advantage	\$ 4,068,877	\$ 0.5525
Environmental Externalities Case 1	\$ 4,944,609	\$ 0.6714
Environmental Externalities Case 2	\$ 5,039,234	\$ 0.6842
Environmental Externalities Case 3	\$ 5,091,442	\$ 0.6913
Simulation Results:		
Monte-Carlo Average	\$ 3,401,470	\$ 0.4604
Monte-Carlo Expected High	\$ 3,492,950	\$ 0.4662
Monte-Carlo Expected Low	\$ 3,041,877	\$ 0.4544

Section 8
Two-year Action Plan

2007 Action Plan and Progress Review

Cascade filed its last Integrated Resource Plan in April, 2007. Since that time, Cascade has made significant progress in meeting its 2-Year Action Plan. Some highlights include:

- Expanded Washington Conservation programs consistent with the steps outlined in the Company's Conservation Plan that was approved by the WUTC in October 2007.
- Updated the independent assessment of the Conservation potential resources that could be acquired within the company's Oregon and Washington service territory
- Expanded IRP modeling to include 10 distinct demand areas

Appendix I includes the detailed 2007 Two-year Action Plan along with a description of the Company's progress on each of the items.

2008 Action Plan

Cascade's 2008 Action Plan is focused on the following five areas:

- Demand Forecasting
- Distribution System Constraint Analysis
- Demand Side Resources
- Supply Side Resources
- Integration

The 2 year action plan embodies Cascade's commitment to maximizing the efficiency from its Integrated Resource Plan and to achieving the lowest cost resource portfolio of reliable natural gas services and conservation.

1. In continuing efforts to create a more accurate load forecast, Cascade will research the viability of expanding the detail of the data by determining therm usage per customer per degree day by customer class (residential, commercial, etc.) along with the non-heat sensitive baseload usage. This is largely dependent upon the capabilities of the Company's new Customer Information System which is currently anticipated to "Go-Live" during mid-2009.
2. Cascade will continue to monitor outside determinants of natural gas usage, such as legislative building code changes and electrical "Direct Use" campaigns as they are determined to significantly affect the Company's forecast.
3. The company continues to explore the incorporation of price elasticity in future forecasts of demand. The integration of this variable in future models will be dependent upon the practicality of its application and significance of its effect.
4. Cascade will continue to monitor the effectiveness of the Oregon Public Purpose Fund to ensure the funds are adequate to capture significant portions of achievable therm savings in Oregon. If it is determined that an increase in this

Fund will create a subsequent increase in therm savings, the company will move to act appropriately.

5. The company will continue to follow and analyze the impacts of the Western Climate Initiative and proposed carbon legislation at both the state and federal level as they pertain to natural gas conservation, as well as other such acts that may arise from these efforts. The company will continue to monitor the timing and the costs associated with carbon legislation and analyze the impacts on the company's overall portfolio costs. As specific carbon legislation is passed, the company will update its avoided cost calculations, conservation potential and make modifications to its DSM incentive programs as necessary.
6. The company will continue to monitor the cost effectiveness of existing conservation measures and emerging technologies to ensure that the current mix of measures included in the Washington Conservation program is appropriate. Areas for further analysis include the impacts associated with modifications to building codes along with the cost effectiveness of newer technologies such the next generation of high efficiency water heaters (.70 EF) and high-efficiency hybrid heat pumps. The applicability of these measures within Cascade's service territory will be analyzed and the company's Conservation Incentive Program will be modified as necessary.
7. The company will continue to work with its Conservation Advisory Group, its third party vendors and its Low income weatherization network to ensure that the therm savings targets identified in the plan are met.
8. The Company will continue to update its distribution system analysis to reflect the impacts of conservation. The company will continue to target its conservation acquisition efforts in those areas where potential distribution constraints have been identified in the hope that some of those investments maybe delayed.
9. Cascade will continue to evaluate gas supply resources on an ongoing basis including supplies of varying lengths (base, swing, peaking) and pricing alternatives. We will continue to analyze the uncertainties associated with volatile supply and demand relationships and will closely monitor and participate in industry discussions regarding diminishing Canadian gas exports. Of particular concern to us are changing conditions on Northwest Pipeline. As our principle upstream pipeline, Northwest Pipeline, is a displacement pipeline dependent upon receiving large amounts of Canadian natural gas exports. The risk associated with reduced Canadian exports is a significant concern and therefore it is critical for Cascade to continuously look for opportunities to improve our supply/capacity diversification.
10. The Company will continue to monitor the proposed pipeline expansion projects to access more supplies out of the Rockies. As cost estimates change, the

company will analyze those resources under consideration to determine if modifications to the preferred portfolio are necessary.

11. Continue to refine our specific peak day resource acquisition action plans to address anticipated capacity shortfalls on the Wenatchee and Shelton laterals. Possible such solutions may be Satellite LNG or pipeline looping to meet the growing requirements of the firm core load. Specifically, the Company will further analyze issues such as determination of project siting issues and risks, project cost estimates, and construction/acquisition lead times.
12. The company will continue to explore options to incorporate BioGas into its portfolio, as specific projects are identified in our service territory. Price, location and gas quality considerations of the BioGas supply will be evaluated.
13. The company will continue to monitor proposed LNG import facilities as information becomes available and will evaluate the various options that, if built, could result. Issues to monitor includes specific cost, the availability of pipeline capacity and project timing.
14. The Company will continue to monitor the futures market for price trends and will evaluate the effectiveness of its risk management policy.

Appendix A-1
IRP Work Plan



222 FAIRVIEW AVENUE N., SEATTLE, WASHINGTON 98109-5312 206-624-3900
FACSIMILE 206-654-4039

December 14, 2007

Washington Utilities & Transportation Commission
P.O. Box 47250
Olympia, WA 98504-7250

Attention: Ms. Carole Washburn
Executive Secretary

RE: Cascade Natural Gas Corporation's 2008 Integrated Resource Plan Work Plan

Pursuant to WAC 480-90-238, enclosed for filing is Cascade Natural Gas Corporation's Work Plan for its 2008 Integrated Resource Plan (IRP or Plan). This document provides an outline of the content for the 2008 Plan, the timing of the plan development and the method for assessing potential resources.

If you have any questions regarding the Work Plan, please contact me at (206) 381-6824.

Sincerely,

A handwritten signature in cursive script that reads "Katherine J. Barnard".

Katherine J. Barnard
Senior Director, Regulatory Affairs

Enclosures

Cascade Natural Gas Corporation 2008 IRP Workplan

Cascade Natural Gas Corporation's ("Cascade" or "the Company") Work Plan for its 2008 Integrated Resource Plan ("IRP") is filed pursuant to the Washington Utilities and Transportation Commission (WUTC) IRP rules (WAC 480-90-238).

Purpose of the Integrated Resource Plan/Key Issues for 2008 IRP

The uncertainty continues to make the decisions of long term planning difficult. Cascade will continue to develop long-term resource strategies in the face of such uncertainty. Analytical methods will be similar to those used to develop the Company's 2007 IRP Plan, which includes the use of a linear programming optimization model (SENDOUT) to solve natural gas supply and transportation optimization questions, along with the use of Monte-Carlo simulations (VECTORGAS) to estimate the impact of various uncertainty factors.

The primary purpose of Cascade's long-term resource planning process has been, and continues to be, to inform and guide the Company's resource acquisition processes, consistent with the rule (WAC 480-90-238). Input and feed back from the Company's Technical Advisory Group (TAG) will continue to be an important resource to help ensure Cascade's IRP is developed from a broader perspective than Cascade could have on its own.

Outline of IRP Content:

The following is an outline of the Company's 2008 IRP plan. This list is based on Cascade's 2007 IRP Plan. Organizational structure of the final IRP may be revised based on results of analysis and feedback received through the planning process.

- I. Executive Summary including Summary Charts & Graphs
- II. Introduction and Discussion of the Plan
- III. Demand Forecast
- IV. Demand Side Resource Alternatives
- V. Supply Side Resource Alternatives
- VI. Integration Analysis and Results including Risk Analyses
 - a. Scenario & Monte Carlo simulations
 - i. Weather Scenarios
 - ii. Gas Price Scenarios including Environmental Externalities (Carbon Tax Adders)
- VII. 2-Year Action Plan
- VIII. Technical Appendices

2008 IRP Timeline

The following is Cascade's tentative 2008 IRP timeline:

- December 14, 2007—Work Plan filed with WUTC
- Develop Demand Forecast: February through May 2008
- Distribution System Planning Analysis: May through Aug 2008
- Demand Side Resource Analysis: February through July 2008
- Gas Supply Analysis: February through June 2008
- Integration of Supply and Conservation Resources: June through July 2008
- Public Process—Technical Advisory Group meetings (specific dates TBD)
 - i. TAG 1; Key Assumptions (price forecast/economic indicators)--Early February 2008
 - ii. TAG 2: Resource Alternatives (Supply & Demand Side Resources) --Late March 2008
 - iii. TAG 3: Demand Forecast Results/Distribution System Modeling – Early May 2008

iv. TAG 4: Integration/ 2 year Action Plan – Early August 2008

- File Draft 2008 IRP: September 2008
- Comments to Company on Draft Plan from parties by November 2008
- Final Plan filed on December 15, 2008

Planning Assumptions

Information needed to perform analysis will be gathered and input assumptions developed by June 2008. This will include detailed definitions of alternative scenarios and all primary input assumptions for demand forecasting and resource modeling. Additional planning information will be assimilated into the analytical process and planning information that is not incorporated into the modeling process will continue to be assessed.

Resource Analysis:

Natural gas analysis will include long-term optimization and stochastic analysis under the same planning scenarios, including natural gas energy efficiency and supply alternatives.

Draft 2008 IRP and Review Period:

Cascade is planning to have its IRP draft plan distributed for initial feedback to the group members by September 30, 2008. Given Cascade's commitment to facilitate and communicate with members of the Technical Advisory Group, the draft IRP content and its key assumptions will be discussed with the Technical Advisory Group during the TAG sessions. Any feedback is due to the Company by November 2008 to give the Company sufficient time to incorporate such feedback as needed into the final plan.

Final 2008 IRP Filed December 15, 2008

Appendix A-2

Tag Meeting Participants & Agendas

Cascade Natural Gas Corporation Technical Advisory Group Meeting Participants

The following company and non-company individuals participated on one or more of the following Technical Advisory Group (TAG) meetings. The TAG meetings were held in February 2008, April, 2008, August, 2008 and October 2008.

Company Participants:

K Barnard	Senior Director Regulatory Affairs & Gas Supply
C. Kautzman	Conservation Program Administrator
P. Schmidt	Senior Rate Analyst
M. Sellers-Vaughn	Manager Gas Supply and Systems
C. La	Senior Gas Supply Planning Analyst
J. Magat	Field Customer Service Analyst
M. Hardesty	Engineer
J. McMaster	Sr. Engineer
L. Espinosa	Director Conservation
L. Tamaye	Rates & Conservation Analyst
A. Spector	Low Income Weatherization Program Administrator

Non-Company Participants:

S. Johnson	Washington Utilities & Transportation Commission
D. Reynolds	Washington Utilities & Transportation Commission
D. Kirkpatrick	Washington Utilities & Transportation Commission
V. Novak	Washington Utilities & Transportation Commission
L. Kittleson	Oregon Public Utilities Commission
B. Tatom	Oregon Public Utilities Commission
K. Zimmerman	Oregon Public Utilities Commission
P. Pyron	NW Industrial Gas Users
D. Kirschner	NW Gas Association
D. Dixon	NW Energy Coalition
C. Ebert	The Energy Project
C. Murray	CTEDS
S. Johnson	Attorney Generals Office
J. Klingele	Cascade Customer

2008 IRP Technical Advisory Group Meetings

February 12, 2008 Agenda Items

- 2008 IRP Workplan Overview
- Action Plan Progress
- Demand Forecast Economic Drivers
- Natural Gas Price Forecasts

April 7, 2008 Agenda Items

- Conservation Resource Alternatives
- Supply Side Resource Alternatives

August 26, 2008 Agenda Items

- 2008 IRP Workplan Overview
- Demand Forecast Results
- Conservation Supply Curves
- Distribution System Planning
- Supply Side Analysis

October 9, 2008 Agenda Items

- 2008 Draft Plan Review
 - Review Plan Key Findings
 - Question/Answer Session

Appendix A-3
IRP Guidelines & Rules

Oregon Public Utility Commission
Adopted IRP Guidelines

Guideline 1: Substantive Requirements

a. *All resources must be evaluated on a consistent and comparable basis.*

- *All known resources for meeting the utility's load should be considered, including supply-side options which focus on the generation, purchase and transmission of power – or gas purchases, transportation, and storage – and demand-side options which focus on conservation and demand response.*

Explanation: Cascade made every effort to include all known supply and demand side options. Supply side options studied include not only the gas itself, but also the pipeline capacity required to transport the gas, the Company's gas storage options, and the system enhancements necessary to distribute the gas. The demand side study looked at all the potential energy savings potentially available within the Company's service territory. Section 6 focuses on supply side resources, while Sections 3 and 5 focused on demand side options including conservation and demand response options. The use of a resource integration model which allows the utility to compare resources on a consistent and comparable basis. The results of the integration modeling can be found in Section 7.

- *Utilities should compare different resource fuel types, technologies, lead times, in-service dates, durations and locations in portfolio risk modeling.*

Explanation: Sections 5 and 6 of the text focus on the demand side and supply side alternatives. Section 5 discusses Demand side resources available including an assessment of the conservation potential that would be available over the planning horizon. The complete list of measures available in Cascade's Oregon service territory is provided in Appendices D-1 and D-2.

On the supply side, Section 6 discusses the supply resources available over the planning horizon. The supply-side options range from existing and proposed interstate pipeline capacity options, various storage options, including leased underground storage alternatives, imported LNG, as well as Satellite LNG facilities located at various locations within the Company's service territory, and unconventional supplies such as Bio-gas. Appendix E clearly defines each resource's availability, pricing assumptions, location and assumed in-service date.

- *Consistent assumptions and methods should be used for evaluation of all resources.*

Oregon Public Utility Commission Adopted IRP Guidelines

Explanation: To the best of its ability, Cascade evaluated all resources, both supply and demand side, on a consistent basis and objectively applied the same common assumptions, approaches and methodology to each option. The resource integration analysis was accomplished through the use of the SENDOUT model. Section 7 contains the specific descriptions of the resource evaluation methodology.

- ***The after-tax marginal weighted-average cost of capital (WACC) should be used to discount all future resource costs.***

Explanation: In the 2008 IRP, the Company uses a real after-tax discount rate of 4.17 percent.

b. Risk and Uncertainty must be considered.

- ***At a minimum, utilities should address the following sources of risk and uncertainty:
Natural gas utilities: demand (peak, swing and baseload), commodity supply and price, transportation availability and price, and cost to comply with any regulation of greenhouse gas emissions.***

Explanation: This Plan (study) is characterized by risk and uncertainty because the Company cannot perfectly predict the contributing data such as future customer counts, economic conditions, market changes and weather conditions. However, this study analyzes risk-related data such that the Company can make reasonable assumptions. Cascade utilized low, medium, and high demand scenarios with low, medium, and high supply cost and availability scenarios to evaluate a range of potential future environments. These scenarios were run through Monte Carlo analysis in the Sendout program to analyze variations in inputs and subsequent demand sensitivities, pricing, and resource timing and selection. Additionally, the company ran several scenarios that capture the range of costs associated with complying with potential greenhouse gas emissions. The company incorporated a range of scenarios that include varying implementation timelines, ranges of throughput subject to potential cap and trade legislation, along with a range of costs associated with purchasing carbon credits.

- ***Utilities should identify in their plans any additional sources of risk and uncertainty.***

Explanation: Various sources of risk and uncertainty are explained in Sections 3 (with respect to the Demand Forecast), 5 (Demand Side Resources), and 6 (Supply Side Resources).

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Adopted IRP Guidelines

c. ***The primary goal must be the selection of a portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its customers.***

- ***The planning horizon for analyzing resource choices should be at least 20 years and account for end effects. Utilities should consider all costs with a reasonable likelihood of being included in rates over the long term, which extends beyond the planning horizon and the life of the resource.***

Explanation: This IRP contains the Company's long-range analysis of load and resources spanning a 20-year horizon.

- ***Utilities should use present value of revenue requirement (PVRR) as the key cost metric. The plan should include analysis of current and estimated future costs for all long-lived resources such as power plants, gas storage facilities, and pipelines, as well as all short-lived resources such as gas supply and short-term power purchases.***

Explanation: The Company's SENDOUT[®] modeling software uses a PVRR cost metric methodology, which provides resource portfolio costs in both nominal and real (present value) dollars that is applied to resources of varying expected lives.

- ***To address risk, the plan should include, at a minimum:***
 1. ***Two measures of PVRR risk: one that measures the variability of costs and one that measures the severity of bad outcomes.***

Explanation: Through application of the SENDOUT[®] software, the Company modeled 200 scenarios around varying gas price and weather inputs via Monte Carlo iterations thereby developing a distribution of annual cost estimates utilizing SENDOUT[®]'s PVRR methodology. Section 7 further describes this analysis while Figure 7-J summarizes this analysis graphically. The variability of costs is plotted against the Basecase while the scenarios beyond the 95th percentile capture the severity of bad outcomes.

2. ***Discussion of the proposed use and impact on costs and risks of physical and financial hedging.***

Explanation: Section 6 discusses Cascade's physical and financial hedging methodology.

- ***The utility should explain in its plan how its resource choices appropriately balance cost and risk.***

Oregon Public Utility Commission
Adopted IRP Guidelines

Explanation: Section 7 discusses Cascade's cost/risk trade off analysis.

- d. The plan must be consistent with the long-run public interest as expressed in Oregon and federal energy policies.***

Explanation: In preparing this plan, Cascade considered the guidelines contained in OPUC Order No. 07-047 as evidenced in this appendix and discussed in greater detail throughout the Plan.

Cascade considered both current and expected state and federal energy policies in portfolio modeling. Section 2 describes the decision making process used to derive portfolios which are consistent with state resource policy directions.

Guideline 2: Procedural Requirements

- a. The public, which includes other utilities, should be allowed significant involvement in the preparation of the IRP. Involvement includes opportunities to contribute information and ideas, as well as to receive information. Parties must have an opportunity to make relevant inquiries of the utility formulating the plan. Disputes about whether information requests are relevant or unreasonably burdensome, or whether a utility is being properly responsive, may be submitted to the Commission for resolution.***

Explanation: The public has been given considerable opportunities to participate in the development of Cascade's 2008 IRP. Section 1 discusses an overview of the public process.

- b. While confidential information must be protected, the utility should make public, in its plan, any non-confidential information that is relevant to its resource evaluation and action plan. Confidential information may be protected through use of a protective order, through aggregation or shielding of data, or through any other mechanism approved by the Commission.***

Explanation: As evidenced by the material included throughout the plan, the Company has put forth all relevant non-confidential information necessary to produce a comprehensive Plan.

- c. The utility must provide a draft IRP for public review and comment prior to filing a final plan with the Commission.***

Oregon Public Utility Commission Adopted IRP Guidelines

Explanation: The Company filed its Draft Plan on October 1, 2008 with both the WUTC, OPUC and provided to all Technical Advisory Group (TAG) members. On October 9, 2008, the Company held an additional TAG meeting to discuss the draft plan with its advisory group and to receive preliminary feedback on the plan. The Company received comments from both WUTC and OPUC Staff and the company has considered those comments, and incorporating those changes where appropriate in the final text.

Guideline 3: Plan Filing, Review, and Updates

- a. The utility must file an IRP for within two years of its previous IRP acknowledgement order.***

Explanation: Cascade's 2004 IRP was acknowledged by the OPUC in August 2005, which based on the 2 year filing requirement, another plan was not due to be filed until August 2007. In January 2007, the OPUC issued Order 07-002 in docket UM 1056 which established a detailed set of guidelines for IRPs. The new guidelines required an annual update, which Cascade submitted to the Commission in August 2007, which requested an extension of the next plan until December 2008 to coincide with the Washington bi-annual filing requirements.

- b. The utility must present the results of its filed plan to the Commission at a public meeting prior to the deadline for written public comment.***

Explanation: Cascade will adhere to this guideline.

- c. Commission Staff and parties should complete their comments and recommendations within six months of IRP filing.***

Explanation: The Company received initial comments from Staff on its published draft plan and looks forward to working with Staff and interested parties in their review of this Plan.

Guideline 4: Plan Components

At a minimum the plan must include the following elements:

- a. An explanation of how the utility met each of the substantive and procedural requirements.***

Explanation: This Appendix is intended to comply with this guideline by providing an itemized response to each of the substantive and procedural requirements.

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b. Analysis of high and low load growth scenarios in addition to stochastic load risk analysis with an explanation of major assumptions.

Explanation: The Base Case demand forecast uses the Company's projected customer growth and projected prices. This IRP considers two departures from the Base Case demand forecast, including low, medium, and high demand growth forecasts, as well as stochastic risk analysis. Section 3 discusses the Demand Forecast scenarios and their assumptions and Section 7 provides the scenario and risk analysis results.

c. For electric utilities ... (Not applicable)

d. For natural gas utilities, a determination of the peaking, swing and base-load gas supply and associated transportation and storage expected for each year of the plan, given existing resources; and identification of gas supplies (peak, swing and base-load), transportation and storage needed to bridge the gap between expected loads and resources.

Explanation: Section 6 details determination of gas supply and associated transportation and storage options, while Section 7 incorporates the forecasted demand load and necessary options to meet that load.

e. Identification and estimated costs of all supply-side and demand-side resource options, taking into account anticipated advances in technology.

Explanation: Section 5 along with Appendix D 1 through 4 identifies the demand side resources options included in this plan. Section 6 along with Appendix E details all supply-side options included in this plan.

f. Analysis of measures the utility intends to take to provide reliable service, including cost-risk tradeoffs.

Explanation: Sections 3 and 4 discusses the modeling tools, customer growth forecasting and cost-risk considerations used to maintain and plan a reliable gas delivery system. Section 6 discusses the diversified infrastructure and multiple supply basin approach that acts to mitigate certain reliability risks.

g. Identification of key assumptions about the future (e.g., fuel prices and environmental compliance costs) and alternative scenarios considered.

Explanation: Section 7 details the key assumptions and alternative scenarios considered in the Plan.

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Adopted IRP Guidelines

- h. Construction of a representative set of resource portfolios to test various operating characteristics, resource types, fuels and sources, technologies, lead times, in-service dates, durations and general locations - system-wide or delivered to a specific portion of the system.**

Explanation: This Plan documents the development and results for resource options evaluated in this IRP. See also guideline 1c for further discussion on resource mix alternatives to portfolios.

- i. Evaluation of the performance of the candidate portfolios over the range of identified risks and uncertainties.**

Explanation: The company evaluated its preferred portfolio by performing stochastic analysis using the Monte Carlo functionality within the SENDOUT model. The analysis allowed for varying price and weather scenarios under 200 different scenarios. Additionally the portfolio of options was reviewed under deterministic scenarios where demand and price vary. For resources selected, we considered other risk factors such as varying lead times required and potential changes in costs in order to test the Basecase scenario assumptions.

- j. Results of testing and rank ordering of the portfolios by cost and risk metric, and interpretation of those results.**

Explanation: Section 7 describes the resource options evaluated, including discussion on uncertainties in lead times and costs as well as viability and resource availability. Figure 7-J proved the testing and rank ordering of the portfolios and the interpretation of those results.

- k. Analysis of the uncertainties associated with each portfolio evaluated.**

Explanation: The See the responses to 1.b above.

- l. Selection of a portfolio that represents the best combination of cost and risk for the utility and its customers.**

Explanation: Cascade evaluated cost/risk tradeoffs for each of the risk analysis portfolios considered. Section 7 shows the company's portfolio risk analysis, as well as the process and determination of the preferred portfolio.

- m. Identification and explanation of any inconsistencies of the selected portfolio with any state and federal energy policies that may affect a utility's plan and any barriers to implementation.**

Explanation: This IRP has presumed no inconsistencies with existing policies. Potential barriers to implementation of the Plan relate to the ultimate availability and

Oregon Public Utility Commission Adopted IRP Guidelines

timing of certain incremental resources selected (e.g. both Satellite and Import LNG, the Rockies pipeline expansion projects along with Biogas alternatives within CNG's distribution system).

- n. ***An action plan with resource activities the utility intends to undertake over the next two to four years to acquire the identified resources, regardless of whether the activity was acknowledged in a previous IRP, with the key attributes of each resource specified as in portfolio testing.***

Explanation: Section 8 presents the Company's 2-year action plan, which identifies the short term actions the Company plans to pursue.

Guideline 5: Transmission

Portfolio analysis should include costs to the utility for the fuel transportation and electric transmission required for each resource being considered. In addition, utilities should consider fuel transportation and electric transmission facilities as resource options, taking into account their value for making additional purchases and sales, accessing less costly resources in remote locations, acquiring alternative fuel supplies, and improving reliability.

Explanation: Not applicable to Cascade's gas utility operations

Guideline 6: Conservation

- a. ***Each utility should ensure that a conservation potential study is conducted periodically for its entire service territory.***

Explanation: As discussed in Section 5, Cascade retained the services of Stellar Processes to analyze the potential energy savings it can cost-effectively procure within its Washington service territory for this IRP and continues to use this model. A similar study was prepared by Stellar Processes for the ETO, in consultation with Cascade, to assess the potential energy savings within Cascade's Oregon service territory. The ETO and Cascade continue to work with Stellar Processes (Stellar) to review existing demographic and energy efficiency measures data sources to identify and quantify technical and achievable resource potential.

- b. ***To the extent that a utility controls the level of funding for conservation programs in its service territory, the utility should include in its action plan all best cost/risk portfolio conservation resources for meeting projected resource needs, specifying annual savings targets.***

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Explanation: Achievable potential DSM savings per customer class in Cascade's Oregon and Washington service territories with cost-effective screening at the Company's Base Case avoided cost is summarized in Section 5.

- c. To the extent that an outside party administers conservation programs in a utility's service territory at a level of funding that is beyond the utility's control, the utility should: 1) determine the amount of conservation resources in the best cost/ risk portfolio without regard to any limits on funding of conservation programs; and 2) identify the preferred portfolio and action plan consistent with the outside party's projection of conservation acquisition.**

Explanation: Because the Company believes funding options are available and understands Staff agrees with this assumption, this guideline is being treated as not applicable.

Guideline 7: Demand Response

Plans should evaluate demand response resources, including voluntary rate programs, on par with other options for meeting energy, capacity, and transmission needs (for electric utilities) or gas supply and transportation needs (for natural gas utilities).

Explanation: Cascade has addressed periodically evaluated conceptual approaches to meeting capacity constraints using demand-response and similar voluntary programs. Interruptible sales service is the most reliable method of achieving demand response (see discussion in Section 5).

Guideline 8: Environmental Costs (As revised in UM1302)

Utilities should include, in their base-case analyses, the regulatory compliance costs they expect for CO₂, NO_x, SO₂, and Hg emissions.

Explanation: Unlike electric utilities, environmental costs rarely impact a gas utility's supply-side resource choices. Section 5 discusses Cascade's assumptions regarding expected environmental costs through a range of possibilities. In Section 7, the Company discusses the impact on system costs based on alternative implementation time lines, cost adders and varying levels of allowances.

Guideline 9: Direct Access Loads

Explanation: Not applicable to natural gas utility.

Guideline 10: Multi-state Utilities

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Multi-state utilities should plan their generation and transmission systems, or gas supply and delivery, on an integrated-system basis that achieves a best cost/risk portfolio for all their retail customers.

Explanation: Cascade's 2008 IRP includes its Oregon and Washington service territories and utilizes an integrated approach in determination of demand, supply, and cost/risk portfolios.

Guideline 11: Reliability

Natural gas utilities should analyze, on an integrated basis, gas supply, transportation, and storage, along with demand-side resources, to reliably meet peak, swing, and base-load system requirements. Electric and natural gas utility plans should demonstrate that the utility's chosen portfolio achieves its stated reliability, cost and risk objectives.

Explanation: Cascade analyzes on an integrated basis, gas supply, transportation, and storage along with demand-side resources to reliably meet peak, swing and base-load system requirements. As discussed throughout the Plan, Cascade's strategy is to reliably serve our firm gas sales customers in a way that minimizes costs over the long term and the Company believes that its basecase portfolio meets these objectives.

Guideline 12: Distributed Generation

Explanation: Not applicable to natural gas utility.

Guideline 13: Resource Acquisition

- a. ***Electric utilities ... (Not applicable)***
- b. ***Natural gas utilities should either describe in the IRP their bidding practices for gas supply and transportation, or provide a description of those practices following IRP acknowledgment.***

Explanation: Cascade's gas procurement strategy is outlined in Section 6

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WAC 480-90-238 Integrated resource planning.

Each natural gas utility regulated by the commission has the responsibility to meet system demand with the least cost mix of natural gas supply and conservation. In furtherance of that responsibility, each natural gas utility must develop an "integrated resource plan."

Content. At a minimum, integrated resource plans must include:

(a) A range of forecasts of future natural gas demand in firm and interruptible markets for each customer class that examine the effect of economic forces on the consumption of natural gas and that address changes in the number, type and efficiency of natural gas end-uses.

Section 3 describes the range of forecast of demand for the 20-year planning horizon. The text provides a range of forecasts that encompass the anticipated forces, both economic and weather-driven, that will impact the load forecasts over the planning horizon. The range of forecasts implicitly incorporates changes in the number, type and efficiency of natural gas end-uses as reflected in the changing use/customer figures over the planning horizon.

(b) An assessment of commercially available conservation, including load management, as well as an assessment of currently employed and new policies and programs needed to obtain the conservation improvements.

Section 5 of the Plan details the company's demand side resource alternatives. The section includes an assessment of technically feasible improvements in the efficient use of natural gas. The detailed list of measures and their savings potential within Cascade's service territory is included in Appendices D-3 and D-4 of the Plan

(c) An assessment of conventional and commercially available nonconventional gas supplies.

(d) An assessment of opportunities for using company-owned or contracted storage.

(e) An assessment of pipeline transmission capability and reliability and opportunities for additional pipeline transmission resources.

Section 6, the supply resource section, includes a discussion of the supply side resource options available including an assessment of conventional and commercially available nonconventional gas supplies, an assessment of opportunities for additional company-owned and contracted storage, and assessment of both existing and future pipeline transmission alternatives for meeting Cascade's load requirements. Appendix E

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contains the detailed list of resources evaluated in the integration model.

(f) A comparative evaluation of the cost of natural gas purchasing strategies, storage options, delivery resources, and improvements in conservation using a consistent method to calculate cost-effectiveness.

Section 7, the integration section, provides a comparative evaluation of the cost of the various resource options on a consistent and comparable method. The company believes that all resources described in this IRP have been evaluated on a consistent and comparable basis through the use of its optimization model.

(g) The integration of the demand forecasts and resource evaluations into a long-range (e.g., at least ten years; longer if appropriate to the life of the resources considered) integrated resource plan describing the mix of resources that is designated to meet current and future needs at the lowest reasonable cost to the utility and its ratepayers.

Explanation: The resource integration section describes the integration of the demand forecast and resource evaluations into a long range resource plan and describes the Company's strategies to reliably meet current and future needs at the lowest reasonable cost to Cascade's ratepayers. According to WAC 480-90-238, "Lowest reasonable cost" means

"the lowest cost mix of resources determined through a detailed and consistent analysis of a wide range of commercially available sources. At a minimum, this analysis must consider resource costs, market-volatility risks, demand-side resource uncertainties, the risks imposed on ratepayers, resource effect on system operations, public policies regarding resource preference adopted by Washington state or the federal government, the cost of risks associated with environmental effects including emissions of carbon dioxide, and the need for security of supply."

Cascade believes all resources described in this IRP have been evaluated on a consistent and comparable basis through the use of its optimization model. Uncertainty has been considered in each component of this plan. The demand forecast includes a reasonable range of uncertainty as quantified in the low, medium and high load growth scenarios along with the additional simulation analysis calculated through the Monte-Carlo functionality that assesses the impacts of weather on the load forecasts. The demand side and supply side resource sections describe relative uncertainties regarding reliability, cost and operating constraints and external costs. Uncertainties associated with the environmental effects of carbon emissions have been discussed in detail and an analysis of the potential impacts of carbon adders on the portfolio has been assessed. The company, through its analysis of limited Canadian supplies has identified alternatives to address concerns regarding security of supply. Price volatility

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and market risks and their impacts on the Company's long-term resource portfolio have been assessed through the use of the monte-carlo functionality of the Sendout model.

(h) A short-term plan outlining the specific actions to be taken by the utility in implementing the long-range integrated resource plan during the two years following submission.

Section 8 includes the 2008 2-Year Action Plan that describes the specific actions the utility will take to implement the long-range integrated resource plan during the next two years

(i) A report on the utility's progress towards implementing the recommendations contained in its previously filed plan.

Appendix I-1 reports on the Company's progress in meeting its 2007 2-Year Action Plan goals.

Timing. Unless otherwise ordered by the commission, each natural gas utility must submit a plan within two years after the date on which the previous plan was filed with the commission. Not later than twelve months prior to the due date of a plan, the utility must provide a work plan for informal commission review. The work plan must outline the content of the integrated resource plan to be developed by the utility and the method for assessing potential resources.

On December 15, 2007, the company submitted its detailed work plan which outlined the content of the plan to be developed and the methods to be used for assessing potential resources.

Cascade's 2008 Integrated Resource Plan will be filed with both the WUTC and OPUC on December 15, 2008.

Public participation. Consultations with commission staff and public participation are essential to the development of an effective plan. The work plan must outline the timing and extent of public participation. In addition, the commission will hear comment on the plan at a public hearing scheduled after the utility submits its plan for commission review.

The work plan identified a preliminary schedule for the Company's Technical Advisory Group meetings and outlined the timing of the filing of the Draft plan in order to allow the parties to provide comments before submission of the Plan on the December 15, 2008.

Washington Utilities & Transportation Commission Adopted IRP Guidelines

To involve public interests in the development stages of this IRP, Cascade has a Technical Advisory Group (TAG). Three meetings were held to discuss the major IRP topics including the key inputs demand forecast, distribution system planning, demand side resources, supply side resources, and resource integration and uncertainty analysis.

The TAG meetings were helpful to Cascade as questions were answered and varying points of view were explored. Appendix A contains an outline of the meeting content and a list of participants. Additionally, customers and interested parties were invited to comment on Cascade's Draft 2008 IRP. A fourth TAG meeting was held in early October to review the Draft Plan. The company received oral and written comments from both WUTC and OPUC Staff and the other interested parties. The written comments are included in Appendix A-4 of the final document. Cascade has made modifications to its Plan to address many of the recommendations received. Where the recommendations were not specifically addressed, the recommendations were incorporated into the Company's 2-year action plan.

Appendix A-4
Comments on Draft IRP

Cascade Natural Gas Draft IRP Review UG-080791

Rule	Requirement	Plan Citation	Notes
WAC 480-90-238(4)	Work plan filed no later than 12 months before next IRP due date.	Appendix A	OK. Filed 12/14/2007 in this docket.
WAC 480-90-238(4)	Work plan outlines content of IRP.	Appendix A	OK.
WAC 480-90-238(4)	Work plan outlines method for assessing potential resources. (See LRC analysis below)	Appendix A	Incomplete. Please look at other companies and include method in next work plan.
WAC 480-90-238(4)	Integrated resource plan submitted within two years of previous plan.		DUE 12/15/2008
WAC 480-90-238(5)	Work plan outlines timing and extent of public participation.	Appendix A	OK. See 2008 IRP Timeline.
WAC 480-90-238(5)	Plan includes description of consultation with commission staff. (Description not required)	Appendix A-2	incomplete
WAC 480-90-238(5)	Commission issues notice of public hearing after company files plan for review.		Expected 12/31/2008
WAC 480-90-238(5)	Commission holds public hearing.		Expected
WAC 480-90-238(2)(a)	Plan describes conservation supply.	Sec 5, pg 38	Technical potential table. Text on page 37 refers to 2007 IRP avoided costs. Please explain why it is appropriate to use old costs. Please include the Stellar Processes report and model with any changes made to the model.
WAC 480-90-238(2)(a)	Plan describes mix of natural gas supply resources.	Sec 6, pg 49-51	OK.
WAC 480-90-238(2)(a)	Plan addresses supply in terms of current and future needs of utility and ratepayers.	Sec 7	OK.
WAC 480-90-238(2)(a)&(b)	Plan uses lowest reasonable cost (LRC) analysis to select mix of resources.	Sec 7, pgs 67-68	Needs detailed discussion. Break down into WA and OR results.
WAC 480-90-238(2)(b)	LRC analysis considers resource costs.	Appendix G-2	OK.
WAC 480-90-238(2)(b)	LRC analysis considers market-volatility risks.	Appendix G-2	OK.
WAC 480-90-238(2)(b)	LRC analysis considers risks imposed on ratepayers.	Appendix H	Please add description of avoided cost calculations and how they are used somewhere in the plan.
WAC 480-90-238(2)(b)	LRC analysis considers demand side uncertainties.	Sec 3 pg 19 & Sec 5 pg 44	OK.
WAC 480-90-238(2)(b)	LRC analysis considers resource effect on system operation.	Sec 4, pgs 22-24	Next plan should consider conservation resource effects also.
WAC 480-90-238(2)(b)	LRC analysis considers public policies regarding resource preference adopted by Washington state or federal government.	Sec 5, pg 45	OK.
WAC 480-90-238(2)(b)	LRC analysis considers cost of risks associated with environmental effects including emissions of carbon dioxide.	Sec 5, pgs 46, 47	OK.
WAC 480-90-238(2)(b)	LRC analysis considers need for security of supply.		Needs discussion.

Cascade Natural Gas Draft IRP Review UG-080791

Rule	Requirement	Plan Citation	Notes
WAC 480-90-238(2)(c)	Plan defines conservation as any reduction in natural gas consumption that results from increases in the efficiency of energy use or distribution.	Sec 5, pg 26	Adjust discussion. Add conservation definition.
WAC 480-90-238(3)(a)	Plan develops forecasts using methods that examine the effect of economic forces on the consumption of natural gas.	Sec 3 pgs 14, 15	Uses economic factors like employment. See Appendices B-1 & B-2. However, pg 20 promises future research on price elasticity. Previous action plan promised same. Please include description in plan.
WAC 480-90-238(3)(a)	Plan develops forecasts using methods that address changes in the number, type and efficiency of natural gas end-uses.	Sec 3, pg 20	Changes in efficiency mentioned on pg 20. Needs more detail. What are current gas end-uses?
WAC 480-90-238(3)(a)	Plan includes a range of forecasts of future demand.	Sec 3, pgs 17, 18	Used high, medium, low. Stochastic analysis could be considered for next plan.
WAC 480-90-238(3)(b)	Plan includes an assessment of currently employed and new policies and programs needed to obtain the conservation improvements.	Appendices D-3 & D-4	Needs discussion.
WAC 480-90-238(3)(b)	Plan includes an assessment of commercially available conservation, including load management.	Sec 5, pgs 38-40	OK.
WAC 480-90-238(3)(c)	Plan includes an assessment of conventional and commercially available nonconventional gas supplies.	Sec 6, pgs 49-51	OK.
WAC 480-90-238(3)(d)	Plan includes an assessment of opportunities for using company-owned or contracted storage.	Sec 6, pg 52	OK.
WAC 480-90-238(3)(e)	Plan includes an assessment of pipeline transmission capability and reliability and opportunities for additional pipeline transmission resources.	Sec 6, pg 54	OK.
WAC 480-90-238(3)(f)	Plan includes a comparative evaluation of the cost of natural gas purchasing strategies, storage options, delivery resources, and improvements in conservation using a consistent method to calculate cost-effectiveness.	Sec 7	OK.
WAC 480-90-238(3)(g)	Demand forecasts and resource evaluations are integrated into the long range plan for resource acquisition.	Sec 7, pg 63	OK.
WAC 480-90-238(3)(g)	Plan includes at least a 10 year long-range planning horizon.	Sec 7, pg 68	OK.
WAC 480-90-238(3)(h)	Plan includes a two-year action plan that implements the long range plan.	Sec 8	incomplete
WAC 480-90-238(3)(i)	Plan includes a progress report on the implementation of the previously filed plan.		Future drafts need to include this item.

**OPUC Staff's Comments/Questions
Cascade Natural Gas Corp.'s Draft 2008 Integrated Resource Plan
November 6, 2008**

Page No.	Comments/Questions	Staff
Section 1: Executive Summary		
2	Do capacity deficits begin in 2010-2011 as stated in paragraph 1 or in 2009 as shown in Appendix F (e.g., Bend, Walla Walla, and Bellingham/Mt. Vernon zones)?	LK
	Paragraph 1 states the Executive Summary “summarizes key findings from this plan.” Please include a summary of the resource needs identified in the plan in the Load Resource Balance section. For example, amounts of deficits identified in Oregon (Bend—GTN) and in Washington (Bellingham and Walla Walla) beginning in 2009. Include this information in the integration section, as well.	LK
3	Summary of Key Findings—Please include the amounts of conservation potential that are identified as cost-effective and achievable by state and in total over the 20-year planning horizon.	LK
4	Are the Sunstone and Blue Bridge pipeline projects the resources chosen to meet near-term needs (2009, 2010) in all of the areas with capacity shortfalls? If not, what are the near-term resources chosen to meet the zonal deficits, and when are the Sunstone/Blue Bridge projects projected to come on-line in the modeling?	LK
	Were bio-gas and satellite LNG facilities chosen by the model? Where? When?	LK
	When was Kitimat LNG chosen in Cascade’s model results? How does elimination of Kitimat from the resource options affect the results of the optimal portfolio?	LK
Section 3: Demand Forecast		
16	Forecast Results—Please include the average annual peak growth rate over 20 years similar to the rate reported in paragraph 2 on average annual demand.	LK
	Please add at least one additional "fundamentals" forecast to gas supply price forecasting. Don't care which you use but Staff would prefer that it not be CERA.	KZ
16-19	The table on this page forecasts positive growth on every measure of system sales and customer usage. Has a 1-3 recession and/or substantial economic “slow down” been considered in these variables? If not, please add that work and adjust the table for its results. If yes, please adjust the table accordingly. Also please adjust the figures on pages 17-19 for these results.	KZ

Page No.	Comments/Questions	Staff
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Section 4: Distribution System Enhancements

What is Cascade's definition of "distribution system constraint?" If Cascade uses a graduated scale of such constraints, please provide that. Include both these items in the Section, if they exist. KZ

24 Please label Table 4-1 as to whether it is denominated in "real" or "nominal" dollars. KZ

Section 5: Demand Side Resources

27 Paragraph 1 states, "a complete copy of the 2007 Update is included in Appendix G-1." Appendix G-1 is the Weather Uncertainty Analysis. The 2007 Update is not included in the draft plan. LK

36 Please include the cumulative total Oregon savings over 20 years in Table 5-5. LK

41 Please include the cum. total Washington savings over 20 years in Table 5-8. LK

46 The statement at the end of paragraph 1 should be revised to include all Oregon conservation programs, not just residential weatherization programs. See Order No. 94-590 (UM 551). LK

Analysis of environmental costs in the plan should be consistent with revised Guideline 8 adopted in Order No. 08-339 (UM 1302). LK

With regard to Carbon Tax modeling, Staff has three suggestions: KZ

1. It seems highly unlikely the US will go with carbon taxes but rather some variation of cap and trade. Staff suggests you spend some time looking at the latter in term of prices and impacts on availability. All the cap and trade actuals and modeling have allowance prices well below the levels Cascade is looking at and all shift the flow of gas around.
2. Did Cascade model direct and indirect affects on both gas prices and availability of carbon costs? If not, Staff suggests you do that.

Staff suggests you model impacts of the climate change legislation just released in draft form. You may be able to do this only at a high level but it's a good learning experience.

Please include an evaluation of demand response in the plan (Guideline 7). LK

Page No.	Comments/Questions	Staff
Section 6: Supply Side Resources		
	<p>Test various "real world" potential natural gas supply price and availability trajectories across the 20-year horizon. Based on current natural gas market characteristics, Staff believes this would encompass at least 8-10 comprehensive alternative scenarios, and near 25 sensitivity runs with SENDOUT[®]. Please describe and explain each scenario/sensitivity, including a rank order comparison of NPVRR results from SENDOUT[®] of each run, along with the base case SENDOUT[®] results.</p>	KZ
	<p>In using SENDOUT[®] to prepare these scenarios and sensitivities, SENDOUT[®] should not be artificially restricted but should be allowed to choose the level and sources of gas supply during each year of the planning horizon. The same goes for the selected base case.</p>	
	<p>The plan assumes natural gas supply will be sufficient to meet demand throughout the forecast period. However, the plan does not examine two developments that might effect this assumption:</p> <ol style="list-style-type: none"> 1. Downturns in economic conditions, e.g., recession. 2. Consolidation of production companies. 	KZ
	<p>Please work out scenarios for these events, qualitatively, with quantitative backup if possible.</p>	
49	<p>Please add a definition and its sources for, "... a best efforts 30-day gas supply purchased on the spot market."</p>	KZ
51	<p>"Due to the potential for interruption of the spot market, these supplies are not considered as reliable a source of gas supply for the winter peaking requirements of Cascade's core market." Please add a longer explanation of this statement. Particularly, explain why spot purchases are not considered as reliable. In this explanation please include a reference to and description of NAESB spot contracts.</p>	KZ
53	<p>"...Cascade has entered into an Agreement with Northwest Pipeline for additional Jackson Prairie storage service beginning early as November 1, 2008, that will replace the access to storage that was available through the Avista storage contract."</p>	KZ
	<p>Please add more details on the option, including its pricing and a comparison of that pricing with other storage options owned by Cascade.</p>	

Page No.	Comments/Questions	Staff
58	<p>“Additionally, the Company is utilizing a programmed buying approach for locking in or hedging gas supply prices. For the 2008/09-contract year, Cascade locked in prices with banks and/or suppliers during three specific time periods (Spring, Summer, and Fall).”</p> <p>Please add more details to this explanation. In particular explain how many and at what levels hedges are entered during each of the time periods mentioned.</p> <p>Please add a table with costs (the same given to <i>SENDOUT</i>[®]) for each of the “Current Resource” and “Future Resource” alternatives. If the costs are averaged or summarized from those given to <i>SENDOUT</i>[®], please explain how the averaging/summarizing was performed.</p>	KZ
Section 7: Resource Integration		
60	<p>“However, because <i>SENDOUT</i>[®] utilizes a linear programming approach, it is important to acknowledge that it is a tool to help build decisions, but because the model has “perfect knowledge” based upon the assumptions provided to it, the theoretical results may or may not be achievable. For this reason the analytical results are considered “deterministic”. For example, the model knows the exact load and price for every day of the planning period and can therefore minimize costs in a way that would not be possible in the real world. Real world decisions must be made where a number of critical factors about the future will always be uncertain. Linear programming analysis provides helpful but not perfect information to guide decisions.” Please reword this paragraph. It’s confusing to me, and I know what you’re trying to express.</p>	KZ
64-67	<p>Please add to Table 7-2 the scenarios requested in Staff’s (KZ) first comment for Section 6. Change the “Integration Results and Key Findings” as necessary based on this additional work.</p>	KZ
64	<p>The analysis of the Load/Resource Balance should precede the demand-side and supply-side resource options identified in the plan to meet the projected deficits over the planning period. At a minimum, the graphs should show the resource needs by state. However, the discussion should tie to the zonal results shown in Appendix F, addressing the timing, location, and size of resource needs on Cascade’s system in both states.</p> <p>The plan should include a summary of the alternative supply-side options, their costs, lead times, in-service dates, and general locations evaluated to meet the projected regional resource deficits identified in the plan. (Guidelines 1c and 4e.)</p>	LK

Page No.	Comments/Questions	Staff
73	The plan should include the modeling results of testing and rank ordering of portfolios (Guideline 4h) by cost and risk metric, and <u>interpretation of the results</u> (Guideline 4j). The plan should clearly identify each of the resources chosen by the modeling and their timing.	LK
	Cascade should demonstrate that its chosen portfolio achieves its stated reliability, cost and risk objectives (Guideline 11).	LK
Section 8: Two Year Action Plan		
76	The action plan should identify the resource activities Cascade intends to undertake in the next 2-4 years to acquire "the identified resources" (Guideline 4n).	LK
	Demand Side Resources—Cascade should include the annual conservation savings targets by state for 2009 and 2010 identified in the IRP (Guideline 6b).	LK
Appendices		
	General—Please number all pages in the appendices.	LK
D-2	Please reconfigure the Oregon Commercial/Industrial Conservation Measures table similar to Appendices D-3 and D-4, including all data related to each measure on one page rather than multiple pages.	LK
F	Please include numerical tables of load/resource balances for each zone, identifying timing and size of resource needs.	LK
H	Avoided Cost Calculations—Are 4.17% and 7.63% (the real and nominal discount rates used in the analysis) the "after-tax marginal weighted average cost of capital (WACC)" required by Guideline 1a?	LK

Appendix B-1

Demand Forecast Model Escalation Rates

ZONES BREAKDOWN				
GTN	Zone 10	Zone 11	Zone 20	Zone 24
Bend Chemult Crescent Gilchrist La Pine Madras Metolius Prineville Redmond Sunriver	Grandview Granger Prosser Sunnyside Toppenish Wapato Zillah	E. Wenatchee Moxee City Quincy Selah Union Gap Wenatchee Yakima	Burbank Finley Kennewick Moses Lake Othello Pasco Richland Wheeler	Baker Huntington Nyssa Ontario Vale
WEATHER AREA Redmond	WEATHER AREA Yakima	WEATHER AREA Yakima	WEATHER AREA Walla Walla	WEATHER AREA Redmond
Zone 26	Zone 30-S	Zone 30-W	Zone ME-OR	Zone ME-WA
Castle Rock Kalama Kelso Longview	Aberdeen Belfair Bremerton Chico Elma Gorst Hoquiam Keyport Manchester McCleary Montesano Port Orchard Poulsbo Shelton Silverdale Sunnyslope	Acme Anacortes Arlington Bellingham Blaine Burlington Deming Everson Ferndale Laconner Lawrence Lynden Mount Vernon Nooksack Oak Harbor Sedro Woolley Stanwood Sumas	Athena Boardman Hermiston Irrigon Milton Freewater Mission Pendleton Pilot Rock Stanfield Umatilla Weston	College Place Walla Walla
WEATHER AREA Hoquiam	WEATHER AREA Hoquiam	WEATHER AREA Bellingham	WEATHER AREA Walla Walla	WEATHER AREA Walla Walla

Adams - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	0.33%	0.13%	-0.07%
2008-2013	0.33%	0.13%	-0.07%
2013-2018	0.26%	0.06%	-0.14%
2018-2019	0.14%	-0.06%	-0.26%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.94%	1.24%	0.54%
2008-2013	1.91%	1.21%	0.51%
2013-2018	1.77%	1.07%	0.37%
2018-2019	1.76%	1.06%	0.36%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	3.26%	1.66%	-0.04%
2008-2013	3.36%	1.76%	0.06%
2013-2018	3.32%	1.72%	0.02%
2018-2019	3.77%	2.17%	0.47%

Baker - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	0.61%	0.01%	-0.29%
2008-2013	0.62%	0.02%	-0.28%
2013-2018	0.56%	-0.04%	-0.34%
2018-2019	0.42%	-0.18%	-0.48%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.33%	0.83%	0.23%
2008-2013	1.34%	0.84%	0.24%
2013-2018	1.29%	0.79%	0.19%
2018-2019	1.30%	0.80%	0.20%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	1.69%	1.19%	0.49%
2008-2013	1.78%	1.28%	0.58%
2013-2018	1.85%	1.35%	0.65%
2018-2019	2.26%	1.76%	1.06%

Benton - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	2.29%	2.09%	1.89%
2008-2013	2.29%	2.09%	1.89%
2013-2018	1.88%	1.68%	1.48%
2018-2019	1.75%	1.55%	1.35%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	3.14%	2.44%	1.74%
2008-2013	3.14%	2.44%	1.74%
2013-2018	2.66%	1.96%	1.26%
2018-2019	2.67%	1.97%	1.27%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.56%	0.96%	-0.74%
2008-2013	2.63%	1.03%	-0.67%
2013-2018	2.75%	1.15%	-0.55%
2018-2019	3.13%	1.53%	-0.17%

Chelan - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.50%	1.30%	1.10%
2008-2013	1.49%	1.29%	1.09%
2013-2018	1.25%	1.05%	0.85%
2018-2019	1.08%	0.88%	0.68%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.60%	1.90%	1.20%
2008-2013	2.59%	1.89%	1.19%
2013-2018	2.29%	1.59%	0.89%
2018-2019	2.30%	1.60%	0.90%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	3.10%	1.50%	-0.20%
2008-2013	3.21%	1.61%	-0.09%
2013-2018	3.23%	1.63%	-0.07%
2018-2019	3.70%	2.10%	0.40%

Cowitz - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	0.75%	0.55%	0.35%
2008-2013	0.75%	0.55%	0.35%
2013-2018	0.66%	0.46%	0.26%
2018-2019	0.55%	0.35%	0.15%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.57%	0.87%	0.17%
2008-2013	1.56%	0.86%	0.16%
2013-2018	1.49%	0.79%	0.09%
2018-2019	1.49%	0.79%	0.09%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.40%	0.80%	-0.90%
2008-2013	2.47%	0.87%	-0.83%
2013-2018	2.58%	0.98%	-0.72%
2018-2019	2.90%	1.30%	-0.40%

Deschutes - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	3.59%	2.99%	2.69%
2008-2013	3.59%	2.99%	2.69%
2013-2018	2.86%	2.26%	1.96%
2018-2019	2.73%	2.13%	1.83%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.97%	2.47%	1.87%
2008-2013	2.97%	2.47%	1.87%
2013-2018	2.48%	1.98%	1.38%
2018-2019	2.48%	1.98%	1.38%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	1.42%	0.92%	0.22%
2008-2013	1.50%	1.00%	0.30%
2013-2018	1.60%	1.10%	0.40%
2018-2019	1.94%	1.44%	0.74%

Douglas - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.37%	1.17%	0.97%
2008-2013	1.37%	1.17%	0.97%
2013-2018	1.17%	0.97%	0.77%
2018-2019	1.04%	0.84%	0.64%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.87%	1.17%	0.47%
2008-2013	1.86%	1.16%	0.46%
2013-2018	1.74%	1.04%	0.34%
2018-2019	1.73%	1.03%	0.33%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	3.00%	1.40%	-0.30%
2008-2013	3.09%	1.49%	-0.21%
2013-2018	3.13%	1.53%	-0.17%
2018-2019	3.58%	1.98%	0.28%

Franklin - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.57%	1.37%	1.17%
2008-2013	1.55%	1.35%	1.15%
2013-2018	1.29%	1.09%	0.89%
2018-2019	1.11%	0.91%	0.71%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.13%	1.43%	0.73%
2008-2013	2.13%	1.43%	0.73%
2013-2018	1.95%	1.25%	0.55%
2018-2019	1.95%	1.25%	0.55%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.58%	0.98%	-0.72%
2008-2013	2.67%	1.07%	-0.63%
2013-2018	2.80%	1.20%	-0.50%
2018-2019	3.21%	1.61%	-0.09%

Grant - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.05%	0.85%	0.65%
2008-2013	1.03%	0.83%	0.63%
2013-2018	0.88%	0.68%	0.48%
2018-2019	0.71%	0.51%	0.31%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.40%	1.70%	1.00%
2008-2013	2.40%	1.70%	1.00%
2013-2018	2.15%	1.45%	0.75%
2018-2019	2.15%	1.45%	0.75%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	3.00%	1.40%	-0.30%
2008-2013	3.09%	1.49%	-0.21%
2013-2018	3.11%	1.51%	-0.19%
2018-2019	3.52%	1.92%	0.22%

Grays Harbor - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	0.84%	0.64%	0.44%
2008-2013	0.84%	0.64%	0.44%
2013-2018	0.74%	0.54%	0.34%
2018-2019	0.61%	0.41%	0.21%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.70%	1.00%	0.30%
2008-2013	1.70%	1.00%	0.30%
2013-2018	1.61%	0.91%	0.21%
2018-2019	1.60%	0.90%	0.20%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.51%	0.91%	-0.79%
2008-2013	2.58%	0.98%	-0.72%
2013-2018	2.68%	1.08%	-0.62%
2018-2019	3.02%	1.42%	-0.28%

Island - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	2.00%	1.80%	1.60%
2008-2013	2.00%	1.80%	1.60%
2013-2018	1.67%	1.47%	1.27%
2018-2019	1.55%	1.35%	1.15%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.14%	1.44%	0.74%
2008-2013	2.15%	1.45%	0.75%
2013-2018	1.96%	1.26%	0.56%
2018-2019	1.97%	1.27%	0.57%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.13%	0.53%	-1.17%
2008-2013	2.19%	0.59%	-1.11%
2013-2018	2.35%	0.75%	-0.95%
2018-2019	2.65%	1.05%	-0.65%

Jefferson - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	2.11%	1.51%	1.21%
2008-2013	2.10%	1.50%	1.20%
2013-2018	1.85%	1.25%	0.95%
2018-2019	1.75%	1.15%	0.85%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.50%	1.00%	0.40%
2008-2013	1.46%	0.96%	0.36%
2013-2018	1.38%	0.88%	0.28%
2018-2019	1.37%	0.87%	0.27%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	0.88%	0.38%	-0.32%
2008-2013	0.97%	0.47%	-0.23%
2013-2018	1.15%	0.65%	-0.05%
2018-2019	1.45%	0.95%	0.25%

Kitsap - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	2.27%	2.07%	1.87%
2008-2013	2.29%	2.09%	1.89%
2013-2018	1.90%	1.70%	1.50%
2018-2019	1.79%	1.59%	1.39%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.26%	1.56%	0.86%
2008-2013	2.26%	1.56%	0.86%
2013-2018	2.05%	1.35%	0.65%
2018-2019	2.05%	1.35%	0.65%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.45%	0.85%	-0.85%
2008-2013	2.52%	0.92%	-0.78%
2013-2018	2.63%	1.03%	-0.67%
2018-2019	2.97%	1.37%	-0.33%

Klamath - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.63%	1.03%	0.73%
2008-2013	1.64%	1.04%	0.74%
2013-2018	1.50%	0.90%	0.60%
2018-2019	1.39%	0.79%	0.49%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.85%	1.35%	0.75%
2008-2013	1.83%	1.33%	0.73%
2013-2018	1.64%	1.14%	0.54%
2018-2019	1.63%	1.13%	0.53%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	1.34%	0.84%	0.14%
2008-2013	1.39%	0.89%	0.19%
2013-2018	1.48%	0.98%	0.28%
2018-2019	1.81%	1.31%	0.61%

Malheur - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.13%	0.53%	0.23%
2008-2013	1.15%	0.55%	0.25%
2013-2018	1.05%	0.45%	0.15%
2018-2019	0.78%	0.18%	-0.12%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.22%	0.72%	0.12%
2008-2013	1.23%	0.73%	0.13%
2013-2018	1.24%	0.74%	0.14%
2018-2019	1.44%	0.94%	0.34%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	1.27%	0.77%	0.07%
2008-2013	1.34%	0.84%	0.14%
2013-2018	1.51%	1.01%	0.31%
2018-2019	2.02%	1.52%	0.82%

Mason - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	2.56%	2.36%	2.16%
2008-2013	2.56%	2.36%	2.16%
2013-2018	2.07%	1.87%	1.67%
2018-2019	1.95%	1.75%	1.55%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	3.00%	2.30%	1.60%
2008-2013	3.00%	2.30%	1.60%
2013-2018	2.57%	1.87%	1.17%
2018-2019	2.57%	1.87%	1.17%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.21%	0.61%	-1.09%
2008-2013	2.29%	0.69%	-1.01%
2013-2018	2.44%	0.84%	-0.86%
2018-2019	2.76%	1.16%	-0.54%

Morrow - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.60%	1.00%	0.70%
2008-2013	1.60%	1.00%	0.70%
2013-2018	1.45%	0.85%	0.55%
2018-2019	1.35%	0.75%	0.45%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.44%	0.94%	0.34%
2008-2013	1.46%	0.96%	0.36%
2013-2018	1.38%	0.88%	0.28%
2018-2019	1.40%	0.90%	0.30%

Skagit - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.82%	1.62%	1.42%
2008-2013	1.82%	1.62%	1.42%
2013-2018	1.53%	1.33%	1.13%
2018-2019	1.40%	1.20%	1.00%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.53%	1.83%	1.13%
2008-2013	2.53%	1.83%	1.13%
2013-2018	2.25%	1.55%	0.85%
2018-2019	2.25%	1.55%	0.85%

Snohomish - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	2.43%	2.23%	2.03%
2008-2013	2.44%	2.24%	2.04%
2013-2018	1.99%	1.79%	1.59%
2018-2019	1.87%	1.67%	1.47%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.56%	1.86%	1.16%
2008-2013	2.56%	1.86%	1.16%
2013-2018	2.27%	1.57%	0.87%
2018-2019	2.27%	1.57%	0.87%

Umatilla - OR

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.89%	1.29%	0.99%
2008-2013	1.90%	1.30%	1.00%
2013-2018	1.68%	1.08%	0.78%
2018-2019	1.49%	0.89%	0.59%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.07%	1.57%	0.97%
2008-2013	2.07%	1.57%	0.97%
2013-2018	1.86%	1.36%	0.76%
2018-2019	1.87%	1.37%	0.77%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	1.23%	0.73%	0.03%
2008-2013	1.30%	0.80%	0.10%
2013-2018	1.42%	0.92%	0.22%
2018-2019	1.73%	1.23%	0.53%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.54%	0.94%	-0.76%
2008-2013	2.61%	1.01%	-0.69%
2013-2018	2.71%	1.11%	-0.59%
2018-2019	3.04%	1.44%	-0.26%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	1.94%	0.34%	-1.36%
2008-2013	2.03%	0.43%	-1.27%
2013-2018	2.23%	0.63%	-1.07%
2018-2019	2.57%	0.97%	-0.73%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	1.41%	0.91%	0.21%
2008-2013	1.48%	0.98%	0.28%
2013-2018	1.58%	1.08%	0.38%
2018-2019	1.92%	1.42%	0.72%

FY08 IRP - CNG COUNTY GROWTH

Walla Walla - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	1.42%	1.22%	1.02%
2008-2013	1.44%	1.24%	1.04%
2013-2018	1.25%	1.05%	0.85%
2018-2019	1.05%	0.85%	0.65%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.32%	1.62%	0.92%
2008-2013	2.32%	1.62%	0.92%
2013-2018	2.08%	1.38%	0.68%
2018-2019	2.06%	1.36%	0.66%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.57%	0.97%	-0.73%
2008-2013	2.63%	1.03%	-0.67%
2013-2018	2.71%	1.11%	-0.59%
2018-2019	3.06%	1.46%	-0.24%

Whatcom - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	2.62%	2.42%	2.22%
2008-2013	2.63%	2.43%	2.23%
2013-2018	2.12%	1.92%	1.72%
2018-2019	2.01%	1.81%	1.61%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	2.85%	2.15%	1.45%
2008-2013	2.85%	2.15%	1.45%
2013-2018	2.47%	1.77%	1.07%
2018-2019	2.45%	1.75%	1.05%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.35%	0.75%	-0.95%
2008-2013	2.42%	0.82%	-0.88%
2013-2018	2.54%	0.94%	-0.76%
2018-2019	2.85%	1.25%	-0.45%

Yakima - WA

Year	Household Growth Rate		
	High	Medium	Low
2008-2009	0.91%	0.71%	0.51%
2008-2013	0.90%	0.70%	0.50%
2013-2018	0.77%	0.57%	0.37%
2018-2019	0.63%	0.43%	0.23%

Year	Employment Growth Rates		
	High	Medium	Low
2008-2009	1.93%	1.23%	0.53%
2008-2013	1.93%	1.23%	0.53%
2013-2018	1.80%	1.10%	0.40%
2018-2019	1.79%	1.09%	0.39%

Year	Income Growth Rates		
	High	Medium	Low
2008-2009	2.89%	1.29%	-0.41%
2008-2013	2.98%	1.38%	-0.32%
2013-2018	3.03%	1.43%	-0.27%
2018-2019	3.44%	1.84%	0.14%

NOTE
 Medium: Woods & Poole Economics Inc.

Appendix B-2

Demand Forecast Model Summary Tables

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
SYSTEM**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	295,735,207	235,951	295,971,158	301,479,360	238,311	301,717,671	290,046,238	233,592	290,279,830
2009	301,177,144	240,828	301,417,972	310,895,022	245,881	311,140,903	292,439,332	235,641	292,674,974
2010	307,015,536	246,074	307,261,611	320,914,420	253,946	321,168,365	295,137,125	237,948	295,375,073
2011	313,478,117	251,817	313,729,934	331,795,562	262,711	332,058,272	298,347,940	240,678	298,588,618
2012	320,245,802	257,871	320,503,673	343,226,589	271,926	343,498,515	301,753,295	243,573	301,996,868
2013	327,153,598	264,059	327,417,656	355,044,554	281,459	355,326,014	305,192,242	246,498	305,438,741
2014	334,040,125	270,225	334,310,349	367,081,935	291,174	367,373,109	308,513,403	249,329	308,762,731
2015	340,973,443	276,465	341,249,908	379,417,959	301,131	379,719,089	311,781,167	252,113	312,033,280
2016	347,832,053	282,660	348,114,713	391,922,638	311,235	392,233,874	314,885,264	254,771	315,140,036
2017	354,772,064	288,914	355,060,977	404,773,843	321,620	405,095,463	317,970,382	257,411	318,227,793
2018	361,732,997	295,221	362,028,218	417,910,564	332,234	418,242,798	320,981,518	259,987	321,241,505
2019	368,657,019	301,502	368,958,521	431,270,524	343,036	431,613,560	323,868,834	262,465	324,131,298
2020	375,667,342	307,799	375,975,141	445,001,775	354,136	445,355,911	326,742,565	264,927	327,007,492
2021	382,667,220	314,108	382,981,328	458,997,804	365,458	459,363,262	329,517,995	267,313	329,785,308
2022	389,617,133	320,389	389,937,522	473,215,569	376,959	473,592,528	332,162,750	269,588	332,432,338
2023	396,566,686	326,684	396,893,370	487,718,109	388,691	488,106,800	334,721,855	271,791	334,993,646
2024	403,523,364	332,989	403,856,353	502,519,051	400,668	502,919,718	337,203,404	273,930	337,477,334
2025	410,476,825	339,302	410,816,127	517,611,289	412,881	518,024,170	339,599,671	275,998	339,875,668
2026	417,422,812	345,615	417,768,427	532,994,212	425,332	533,419,544	341,908,713	277,993	342,186,706
2027	424,399,177	351,984	424,751,162	548,721,612	438,063	549,159,675	344,162,799	279,941	344,442,740
2028	431,425,499	358,393	431,783,892	564,824,808	451,101	565,275,909	346,378,859	281,858	346,660,717
2029	438,414,861	364,791	438,779,653	581,197,218	464,354	581,661,572	348,487,454	283,682	348,771,136
2030	445,423,601	371,197	445,794,798	597,918,405	477,899	598,396,304	350,534,868	285,460	350,820,328

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	0.34%	1.18%	0.34%	1.28%	1.18%	1.28%	-0.60%	1.18%	-0.59%
2009	1.84%	2.07%	1.84%	3.12%	3.18%	3.12%	0.83%	0.88%	0.83%
2010	1.94%	2.18%	1.94%	3.22%	3.28%	3.22%	0.92%	0.98%	0.92%
2011	2.10%	2.33%	2.11%	3.39%	3.45%	3.39%	1.09%	1.15%	1.09%
2012	2.16%	2.40%	2.16%	3.45%	3.51%	3.45%	1.14%	1.20%	1.14%
2013	2.16%	2.40%	2.16%	3.44%	3.51%	3.44%	1.14%	1.20%	1.14%
2014	2.10%	2.34%	2.11%	3.39%	3.45%	3.39%	1.09%	1.15%	1.09%
2015	2.08%	2.31%	2.08%	3.36%	3.42%	3.36%	1.06%	1.12%	1.06%
2016	2.01%	2.24%	2.01%	3.30%	3.36%	3.30%	1.00%	1.05%	1.00%
2017	2.00%	2.21%	2.00%	3.28%	3.34%	3.28%	0.98%	1.04%	0.98%
2018	1.96%	2.18%	1.96%	3.25%	3.30%	3.25%	0.95%	1.00%	0.95%
2019	1.91%	2.13%	1.91%	3.20%	3.25%	3.20%	0.90%	0.95%	0.90%
2020	1.90%	2.09%	1.90%	3.18%	3.24%	3.18%	0.89%	0.94%	0.89%
2021	1.86%	2.05%	1.86%	3.15%	3.20%	3.15%	0.85%	0.90%	0.85%
2022	1.82%	2.00%	1.82%	3.10%	3.15%	3.10%	0.80%	0.85%	0.80%
2023	1.78%	1.96%	1.78%	3.06%	3.11%	3.06%	0.77%	0.82%	0.77%
2024	1.75%	1.93%	1.75%	3.03%	3.08%	3.03%	0.74%	0.79%	0.74%
2025	1.72%	1.90%	1.72%	3.00%	3.05%	3.00%	0.71%	0.75%	0.71%
2026	1.69%	1.86%	1.69%	2.97%	3.02%	2.97%	0.68%	0.72%	0.68%
2027	1.67%	1.84%	1.67%	2.95%	2.99%	2.95%	0.66%	0.70%	0.66%
2028	1.66%	1.82%	1.66%	2.93%	2.98%	2.93%	0.64%	0.68%	0.64%
2029	1.62%	1.79%	1.62%	2.90%	2.94%	2.90%	0.61%	0.65%	0.61%
2030	1.60%	1.76%	1.60%	2.88%	2.92%	2.88%	0.59%	0.63%	0.59%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
SYSTEM**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	235,951	3,092,197	3,328,148	238,311	3,123,119	3,361,429	233,592	3,061,275	3,294,866
2009	240,828	3,150,777	3,391,606	245,881	3,221,765	3,467,646	235,641	3,087,594	3,323,236
2010	246,074	3,214,549	3,460,623	253,946	3,326,752	3,580,698	237,948	3,117,164	3,355,112
2011	251,817	3,285,396	3,537,213	262,711	3,440,691	3,703,401	240,678	3,152,126	3,392,804
2012	257,871	3,361,379	3,619,251	271,926	3,560,553	3,832,479	243,573	3,189,301	3,432,874
2013	264,059	3,440,691	3,704,750	281,459	3,684,502	3,965,961	246,498	3,226,843	3,473,342
2014	270,225	3,521,086	3,791,311	291,174	3,810,692	4,101,866	249,329	3,263,058	3,512,387
2015	276,465	3,601,715	3,878,180	301,131	3,940,015	4,241,145	252,113	3,298,688	3,550,801
2016	282,660	3,681,768	3,964,429	311,235	4,070,851	4,382,086	254,771	3,332,341	3,587,113
2017	288,914	3,762,609	4,051,523	321,620	4,205,364	4,526,984	257,411	3,365,822	3,623,233
2018	295,221	3,843,752	4,138,974	332,234	4,342,918	4,675,152	259,987	3,398,544	3,658,531
2019	301,502	3,925,019	4,226,521	343,036	4,482,677	4,825,713	262,465	3,429,828	3,692,292
2020	307,799	4,006,340	4,314,139	354,136	4,626,435	4,980,570	264,927	3,461,044	3,725,971
2021	314,108	4,087,657	4,401,765	365,458	4,772,767	5,138,225	267,313	3,491,052	3,758,364
2022	320,389	4,168,274	4,488,663	376,959	4,921,463	5,298,422	269,588	3,519,692	3,789,279
2023	326,684	4,248,910	4,575,594	388,691	5,073,117	5,461,808	271,791	3,547,396	3,819,186
2024	332,989	4,330,118	4,663,106	400,668	5,227,863	5,628,531	273,930	3,574,244	3,848,174
2025	339,302	4,410,904	4,750,206	412,881	5,385,624	5,798,505	275,998	3,600,154	3,876,151
2026	345,615	4,491,717	4,837,332	425,332	5,546,372	5,971,704	277,993	3,625,093	3,903,085
2027	351,984	4,572,521	4,924,505	438,063	5,710,568	6,148,631	279,941	3,649,343	3,929,283
2028	358,393	4,654,866	5,013,259	451,101	5,878,762	6,329,863	281,858	3,673,228	3,955,086
2029	364,791	4,737,578	5,102,369	464,354	6,049,850	6,514,204	283,682	3,696,014	3,979,696
2030	371,197	4,818,232	5,189,429	477,899	6,224,268	6,702,167	285,460	3,717,953	4,003,413

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth
2008	1.18%	-7.26%	-6.71%	1.18%	-7.26%	-6.71%	1.18%	-7.26%	-6.71%
2009	2.07%	1.89%	1.91%	3.18%	3.16%	3.16%	0.88%	0.86%	0.86%
2010	2.18%	2.02%	2.03%	3.28%	3.26%	3.26%	0.98%	0.96%	0.96%
2011	2.33%	2.20%	2.21%	3.45%	3.42%	3.43%	1.15%	1.12%	1.12%
2012	2.40%	2.31%	2.32%	3.51%	3.48%	3.49%	1.20%	1.18%	1.18%
2013	2.40%	2.36%	2.36%	3.51%	3.48%	3.48%	1.20%	1.18%	1.18%
2014	2.34%	2.34%	2.34%	3.45%	3.42%	3.43%	1.15%	1.12%	1.12%
2015	2.31%	2.29%	2.29%	3.42%	3.39%	3.40%	1.12%	1.09%	1.09%
2016	2.24%	2.22%	2.22%	3.36%	3.32%	3.32%	1.05%	1.02%	1.02%
2017	2.21%	2.20%	2.20%	3.34%	3.30%	3.31%	1.04%	1.00%	1.01%
2018	2.18%	2.16%	2.16%	3.30%	3.27%	3.27%	1.00%	0.97%	0.97%
2019	2.13%	2.11%	2.12%	3.25%	3.22%	3.22%	0.95%	0.92%	0.92%
2020	2.09%	2.07%	2.07%	3.24%	3.21%	3.21%	0.94%	0.91%	0.91%
2021	2.05%	2.03%	2.03%	3.20%	3.16%	3.17%	0.90%	0.87%	0.87%
2022	2.00%	1.97%	1.97%	3.15%	3.12%	3.12%	0.85%	0.82%	0.82%
2023	1.96%	1.93%	1.94%	3.11%	3.08%	3.08%	0.82%	0.79%	0.79%
2024	1.93%	1.91%	1.91%	3.08%	3.05%	3.05%	0.79%	0.76%	0.76%
2025	1.90%	1.87%	1.87%	3.05%	3.02%	3.02%	0.75%	0.72%	0.73%
2026	1.86%	1.83%	1.83%	3.02%	2.98%	2.99%	0.72%	0.69%	0.69%
2027	1.84%	1.80%	1.80%	2.99%	2.96%	2.96%	0.70%	0.67%	0.67%
2028	1.82%	1.80%	1.80%	2.98%	2.95%	2.95%	0.68%	0.65%	0.66%
2029	1.79%	1.78%	1.78%	2.94%	2.91%	2.91%	0.65%	0.62%	0.62%
2030	1.76%	1.70%	1.71%	2.92%	2.88%	2.89%	0.63%	0.59%	0.60%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
SYSTEM**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	157,605,281	138,365,877	295,971,158	160,773,147	140,944,524	301,717,671	154,468,936	135,810,894	290,279,830
2009	161,391,072	140,026,900	301,417,972	166,705,886	144,435,016	311,140,903	156,605,478	136,069,495	292,674,974
2010	165,475,175	141,786,436	307,261,611	173,074,449	148,093,916	321,168,365	158,970,796	136,404,277	295,375,073
2011	169,821,800	143,908,135	313,729,934	179,854,881	152,203,391	332,058,272	161,523,231	137,065,387	298,588,618
2012	174,349,614	146,154,059	320,503,673	186,972,813	156,525,702	343,498,515	164,179,754	137,817,114	301,996,868
2013	178,951,910	148,465,746	327,417,656	194,322,232	161,003,782	355,326,014	166,836,858	138,601,883	305,438,741
2014	183,538,888	150,771,461	334,310,349	201,810,115	165,562,994	367,373,109	169,410,692	139,352,039	308,762,731
2015	188,148,528	153,101,380	341,249,908	209,480,856	170,238,234	379,719,089	171,937,497	140,095,783	312,033,280
2016	192,752,708	155,362,005	348,114,713	217,306,483	174,927,390	392,233,874	174,392,305	140,747,731	315,140,036
2017	197,361,811	157,699,167	355,060,977	225,301,456	179,794,007	405,095,463	176,785,649	141,442,144	318,227,793
2018	202,002,571	160,025,648	362,028,218	233,499,768	184,743,030	418,242,798	179,142,173	142,099,333	321,241,505
2019	206,624,800	162,333,720	368,958,521	241,846,990	189,766,570	431,613,560	181,418,029	142,713,270	324,131,298
2020	211,255,920	164,719,221	375,975,141	250,377,793	194,978,117	445,355,911	183,638,586	143,368,906	327,007,492
2021	215,889,814	167,091,514	382,981,328	259,088,271	200,274,991	459,363,262	185,799,379	143,985,929	329,785,308
2022	220,532,232	169,405,290	389,937,522	267,988,622	205,603,906	473,592,528	187,906,254	144,526,083	332,432,338
2023	225,183,166	171,710,204	396,893,370	277,082,364	211,024,436	488,106,800	189,959,990	145,033,656	334,993,646
2024	229,817,267	174,039,086	403,856,353	286,341,502	216,578,216	502,919,718	191,940,193	145,537,141	337,477,334
2025	234,458,151	176,357,976	410,816,127	295,798,291	222,225,880	518,024,170	193,867,791	146,007,877	339,875,668
2026	239,096,680	178,671,747	417,768,427	305,444,670	227,974,874	533,419,544	195,736,099	146,450,607	342,186,706
2027	243,761,950	180,989,212	424,751,162	315,321,514	233,838,161	549,159,675	197,569,706	146,873,034	344,442,740
2028	248,405,974	183,377,918	431,783,892	325,370,672	239,905,236	565,275,909	199,330,396	147,330,321	346,660,717
2029	252,982,867	185,796,786	438,779,653	335,533,710	246,127,862	581,661,572	200,983,154	147,787,982	348,771,136
2030	257,644,820	188,149,978	445,794,798	346,015,174	252,381,129	598,396,304	202,650,191	148,170,136	350,820,328

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	2.40%	1.20%	1.84%	3.69%	2.48%	3.12%	1.38%	0.19%	0.83%
2010	2.53%	1.26%	1.94%	3.82%	2.53%	3.22%	1.51%	0.25%	0.92%
2011	2.63%	1.50%	2.11%	3.92%	2.77%	3.39%	1.61%	0.48%	1.09%
2012	2.67%	1.56%	2.16%	3.96%	2.84%	3.45%	1.64%	0.55%	1.14%
2013	2.64%	1.58%	2.16%	3.93%	2.86%	3.44%	1.62%	0.57%	1.14%
2014	2.56%	1.55%	2.11%	3.85%	2.83%	3.39%	1.54%	0.54%	1.09%
2015	2.51%	1.55%	2.08%	3.80%	2.82%	3.36%	1.49%	0.53%	1.06%
2016	2.45%	1.48%	2.01%	3.74%	2.75%	3.30%	1.43%	0.47%	1.00%
2017	2.39%	1.50%	2.00%	3.68%	2.78%	3.28%	1.37%	0.49%	0.98%
2018	2.35%	1.48%	1.96%	3.64%	2.75%	3.25%	1.33%	0.46%	0.95%
2019	2.29%	1.44%	1.91%	3.57%	2.72%	3.20%	1.27%	0.43%	0.90%
2020	2.24%	1.47%	1.90%	3.53%	2.75%	3.18%	1.22%	0.46%	0.89%
2021	2.19%	1.44%	1.86%	3.48%	2.72%	3.15%	1.18%	0.43%	0.85%
2022	2.15%	1.38%	1.82%	3.44%	2.66%	3.10%	1.13%	0.38%	0.80%
2023	2.11%	1.36%	1.78%	3.39%	2.64%	3.06%	1.09%	0.35%	0.77%
2024	2.06%	1.36%	1.75%	3.34%	2.63%	3.03%	1.04%	0.35%	0.74%
2025	2.02%	1.33%	1.72%	3.30%	2.61%	3.00%	1.00%	0.32%	0.71%
2026	1.98%	1.31%	1.69%	3.26%	2.59%	2.97%	0.96%	0.30%	0.68%
2027	1.95%	1.30%	1.67%	3.23%	2.57%	2.95%	0.94%	0.29%	0.66%
2028	1.91%	1.32%	1.66%	3.19%	2.59%	2.93%	0.89%	0.31%	0.64%
2029	1.84%	1.32%	1.62%	3.12%	2.59%	2.90%	0.83%	0.31%	0.61%
2030	1.84%	1.27%	1.60%	3.12%	2.54%	2.88%	0.83%	0.26%	0.59%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
SYSTEM

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	223,265	33,330	256,596	225,498	33,664	259,162	221,032	32,997	254,030
2009	229,131	33,897	263,027	234,333	34,666	268,999	224,582	33,224	257,806
2010	235,447	34,492	269,939	243,822	35,719	279,540	228,477	33,471	261,948
2011	242,138	35,142	277,280	253,905	36,850	290,755	232,632	33,763	266,395
2012	249,103	35,824	284,927	264,493	38,038	302,531	236,942	34,076	271,018
2013	256,190	36,521	292,712	275,440	39,266	314,706	241,259	34,393	275,652
2014	263,270	37,214	300,484	286,612	40,514	327,126	245,459	34,697	280,155
2015	270,395	37,912	308,307	298,072	41,793	339,865	249,593	34,996	284,589
2016	277,526	38,609	316,135	309,780	43,097	352,877	253,627	35,284	288,911
2017	284,677	39,306	323,983	321,760	44,427	366,186	257,573	35,564	293,138
2018	291,885	40,003	331,888	334,056	45,783	379,839	261,467	35,834	297,301
2019	299,080	40,697	339,777	346,596	47,163	393,760	265,247	36,094	301,340
2020	306,301	41,394	347,695	359,430	48,574	408,004	268,948	36,346	305,294
2021	313,541	42,091	355,632	372,553	50,014	422,567	272,566	36,591	309,156
2022	320,806	42,792	363,599	385,981	51,486	437,467	276,107	36,830	312,936
2023	328,098	43,496	371,594	399,719	52,991	452,710	279,572	37,063	316,636
2024	335,379	44,200	379,579	413,729	54,526	468,255	282,933	37,288	320,221
2025	342,684	44,906	387,590	428,058	56,094	484,152	286,219	37,507	323,726
2026	349,999	45,616	395,615	442,695	57,697	500,392	289,421	37,720	327,141
2027	357,373	46,329	403,702	457,707	59,337	517,044	292,578	37,929	330,507
2028	364,724	47,045	411,770	472,999	61,011	534,010	295,625	38,132	333,757
2029	371,989	47,766	419,755	488,488	62,725	551,213	298,513	38,331	336,844
2030	379,383	48,479	427,862	504,464	64,463	568,927	301,417	38,516	339,934

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	2.40%	2.03%	2.35%	2.40%	2.03%	2.35%	2.40%	2.03%	2.35%
2009	2.63%	1.70%	2.51%	3.92%	2.98%	3.80%	1.61%	0.69%	1.49%
2010	2.76%	1.76%	2.63%	4.05%	3.04%	3.92%	1.73%	0.74%	1.61%
2011	2.84%	1.89%	2.72%	4.14%	3.17%	4.01%	1.82%	0.87%	1.70%
2012	2.88%	1.94%	2.76%	4.17%	3.22%	4.05%	1.85%	0.93%	1.74%
2013	2.85%	1.95%	2.73%	4.14%	3.23%	4.02%	1.82%	0.93%	1.71%
2014	2.76%	1.90%	2.66%	4.06%	3.18%	3.95%	1.74%	0.88%	1.63%
2015	2.71%	1.88%	2.60%	4.00%	3.16%	3.89%	1.68%	0.86%	1.58%
2016	2.64%	1.84%	2.54%	3.93%	3.12%	3.83%	1.62%	0.82%	1.52%
2017	2.58%	1.81%	2.48%	3.87%	3.09%	3.77%	1.56%	0.79%	1.46%
2018	2.53%	1.77%	2.44%	3.82%	3.05%	3.73%	1.51%	0.76%	1.42%
2019	2.47%	1.74%	2.38%	3.75%	3.02%	3.66%	1.45%	0.72%	1.36%
2020	2.41%	1.71%	2.33%	3.70%	2.99%	3.62%	1.40%	0.70%	1.31%
2021	2.36%	1.69%	2.28%	3.65%	2.96%	3.57%	1.34%	0.67%	1.27%
2022	2.32%	1.67%	2.24%	3.60%	2.94%	3.53%	1.30%	0.65%	1.22%
2023	2.27%	1.65%	2.20%	3.56%	2.92%	3.48%	1.26%	0.63%	1.18%
2024	2.22%	1.62%	2.15%	3.50%	2.90%	3.43%	1.20%	0.61%	1.13%
2025	2.18%	1.60%	2.11%	3.46%	2.88%	3.40%	1.16%	0.59%	1.09%
2026	2.13%	1.58%	2.07%	3.42%	2.86%	3.35%	1.12%	0.57%	1.05%
2027	2.11%	1.56%	2.04%	3.39%	2.84%	3.33%	1.09%	0.55%	1.03%
2028	2.06%	1.54%	2.00%	3.34%	2.82%	3.28%	1.04%	0.53%	0.98%
2029	1.99%	1.53%	1.94%	3.27%	2.81%	3.22%	0.98%	0.52%	0.92%
2030	1.99%	1.49%	1.93%	3.27%	2.77%	3.21%	0.97%	0.48%	0.92%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
OREGON**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	71,994,307	58,455	72,052,762	73,401,758	59,040	73,460,798	70,600,470	57,871	70,658,341
2009	73,384,258	59,662	73,443,920	75,763,784	61,003	75,824,787	71,243,854	58,459	71,302,314
2010	75,079,807	61,106	75,140,913	78,492,394	63,267	78,555,662	72,161,806	59,275	72,221,081
2011	77,011,828	62,750	77,074,578	81,527,472	65,783	81,593,255	73,279,939	60,257	73,340,196
2012	79,226,822	64,650	79,291,472	84,929,120	68,595	84,997,715	74,635,934	61,432	74,697,367
2013	81,552,374	66,649	81,619,022	88,523,361	71,567	88,594,927	76,060,892	62,666	76,123,558
2014	83,862,297	68,632	83,930,929	92,177,513	74,591	92,252,104	77,435,574	63,859	77,499,432
2015	86,191,650	70,645	86,262,295	95,931,102	77,697	96,008,799	78,793,248	65,035	78,858,283
2016	88,466,964	72,618	88,539,582	99,704,195	80,829	99,785,024	80,066,862	66,149	80,133,011
2017	90,743,055	74,592	90,817,646	103,557,899	84,027	103,641,927	81,308,041	67,234	81,375,274
2018	93,049,351	76,590	93,125,941	107,527,345	87,318	107,614,663	82,543,657	68,310	82,611,967
2019	95,329,371	78,566	95,407,937	111,549,798	90,657	111,640,455	83,723,333	69,342	83,792,675
2020	97,630,514	80,559	97,711,073	115,681,245	94,083	115,775,328	84,889,895	70,360	84,960,254
2021	99,891,394	82,521	99,973,915	119,851,173	97,550	119,948,723	85,989,914	71,327	86,061,241
2022	102,206,313	84,528	102,290,841	124,172,808	101,136	124,273,944	87,106,095	72,301	87,178,397
2023	104,538,109	86,548	104,624,657	128,604,823	104,812	128,709,634	88,205,888	73,261	88,279,149
2024	106,865,018	88,562	106,953,581	133,122,664	108,560	133,231,224	89,271,040	74,190	89,345,230
2025	109,208,173	90,589	109,298,761	137,754,165	112,400	137,866,565	90,319,792	75,105	90,394,896
2026	111,562,768	92,623	111,655,391	142,495,657	116,331	142,611,989	91,348,248	76,001	91,424,249
2027	113,946,225	94,692	114,040,916	147,371,928	120,373	147,492,300	92,370,734	76,890	92,447,624
2028	116,306,296	96,726	116,403,022	152,317,827	124,474	152,442,301	93,344,953	77,739	93,422,693
2029	118,584,375	98,686	118,683,061	157,256,018	128,566	157,384,585	94,225,536	78,508	94,304,044
2030	120,882,489	100,660	120,983,149	162,321,134	132,762	162,453,896	95,095,178	79,265	95,174,443

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	0.94%	5.14%	0.94%	1.89%	5.14%	1.89%	-0.02%	5.14%	-0.01%
2009	1.93%	2.06%	1.93%	3.22%	3.33%	3.22%	0.91%	1.02%	0.91%
2010	2.31%	2.42%	2.31%	3.60%	3.71%	3.60%	1.29%	1.40%	1.29%
2011	2.57%	2.69%	2.57%	3.87%	3.98%	3.87%	1.55%	1.66%	1.55%
2012	2.88%	3.03%	2.88%	4.17%	4.27%	4.17%	1.85%	1.95%	1.85%
2013	2.94%	3.09%	2.94%	4.23%	4.33%	4.23%	1.91%	2.01%	1.91%
2014	2.83%	2.98%	2.83%	4.13%	4.23%	4.13%	1.81%	1.90%	1.81%
2015	2.78%	2.93%	2.78%	4.07%	4.16%	4.07%	1.75%	1.84%	1.75%
2016	2.64%	2.79%	2.64%	3.93%	4.03%	3.93%	1.62%	1.71%	1.62%
2017	2.57%	2.72%	2.57%	3.87%	3.96%	3.87%	1.55%	1.64%	1.55%
2018	2.54%	2.68%	2.54%	3.83%	3.92%	3.83%	1.52%	1.60%	1.52%
2019	2.45%	2.58%	2.45%	3.74%	3.82%	3.74%	1.43%	1.51%	1.43%
2020	2.41%	2.54%	2.41%	3.70%	3.78%	3.70%	1.39%	1.47%	1.39%
2021	2.32%	2.44%	2.32%	3.60%	3.68%	3.60%	1.30%	1.37%	1.30%
2022	2.32%	2.43%	2.32%	3.61%	3.68%	3.61%	1.30%	1.37%	1.30%
2023	2.28%	2.39%	2.28%	3.57%	3.63%	3.57%	1.26%	1.33%	1.26%
2024	2.23%	2.33%	2.23%	3.51%	3.58%	3.51%	1.21%	1.27%	1.21%
2025	2.19%	2.29%	2.19%	3.48%	3.54%	3.48%	1.17%	1.23%	1.17%
2026	2.16%	2.25%	2.16%	3.44%	3.50%	3.44%	1.14%	1.19%	1.14%
2027	2.14%	2.23%	2.14%	3.42%	3.47%	3.42%	1.12%	1.17%	1.12%
2028	2.07%	2.15%	2.07%	3.36%	3.41%	3.36%	1.05%	1.11%	1.05%
2029	1.96%	2.03%	1.96%	3.24%	3.29%	3.24%	0.94%	0.99%	0.94%
2030	1.94%	2.00%	1.94%	3.22%	3.26%	3.22%	0.92%	0.96%	0.92%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
OREGON**

Peak Day - Baseload									
Heating Season	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	58,455	766,879	825,334	59,040	774,548	833,588	57,871	759,210	817,081
2009	59,662	779,345	839,006	61,003	799,088	860,091	58,459	765,755	824,214
2010	61,106	795,294	856,400	63,267	827,455	890,723	59,275	775,229	834,505
2011	62,750	814,689	877,439	65,783	859,091	924,873	60,257	786,909	847,166
2012	64,650	837,376	902,027	68,595	894,835	963,429	61,432	801,383	862,815
2013	66,649	862,362	929,010	71,567	932,644	1,004,211	62,666	816,633	879,299
2014	68,632	888,003	956,636	74,591	971,013	1,045,604	63,859	831,283	895,142
2015	70,645	913,986	984,631	77,697	1,010,448	1,088,145	65,035	845,772	910,807
2016	72,618	939,165	1,011,783	80,829	1,049,847	1,130,676	66,149	859,161	925,310
2017	74,592	964,338	1,038,930	84,027	1,090,093	1,174,120	67,234	872,213	939,447
2018	76,590	989,952	1,066,542	87,318	1,131,638	1,218,956	68,310	885,282	953,592
2019	78,566	1,015,108	1,093,674	90,657	1,173,588	1,264,245	69,342	897,640	966,982
2020	80,559	1,040,528	1,121,087	94,083	1,216,749	1,310,833	70,360	909,920	980,279
2021	82,521	1,065,256	1,147,777	97,550	1,260,083	1,357,634	71,327	921,323	992,650
2022	84,528	1,090,742	1,175,270	101,136	1,305,163	1,406,298	72,301	933,027	1,005,329
2023	86,548	1,116,441	1,202,990	104,812	1,351,412	1,456,223	73,261	944,574	1,017,834
2024	88,562	1,142,040	1,230,602	108,560	1,398,489	1,507,049	74,190	955,709	1,029,899
2025	90,589	1,167,780	1,258,369	112,400	1,446,764	1,559,164	75,105	966,683	1,041,788
2026	92,623	1,193,606	1,286,230	116,331	1,496,160	1,612,491	76,001	977,429	1,053,430
2027	94,692	1,219,441	1,314,133	120,373	1,546,838	1,667,210	76,890	988,038	1,064,928
2028	96,726	1,245,474	1,342,201	124,474	1,598,225	1,722,700	77,739	998,131	1,075,871
2029	98,686	1,271,092	1,369,778	128,566	1,649,486	1,778,053	78,508	1,007,209	1,085,717
2030	100,660	1,295,976	1,396,635	132,762	1,702,036	1,834,798	79,265	1,016,160	1,095,425

Annual Growth Rates									
Heating Season	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	5.14%	2.06%	2.28%	5.14%	2.06%	2.28%	5.14%	2.06%	2.28%
2009	2.06%	1.63%	1.66%	3.33%	3.17%	3.18%	1.02%	0.86%	0.87%
2010	2.42%	2.05%	2.07%	3.71%	3.55%	3.56%	1.40%	1.24%	1.25%
2011	2.69%	2.44%	2.46%	3.98%	3.82%	3.83%	1.66%	1.51%	1.52%
2012	3.03%	2.78%	2.80%	4.27%	4.16%	4.17%	1.95%	1.84%	1.85%
2013	3.09%	2.98%	2.99%	4.33%	4.23%	4.23%	2.01%	1.90%	1.91%
2014	2.98%	2.97%	2.97%	4.23%	4.11%	4.12%	1.90%	1.79%	1.80%
2015	2.93%	2.93%	2.93%	4.16%	4.06%	4.07%	1.84%	1.74%	1.75%
2016	2.79%	2.75%	2.76%	4.03%	3.90%	3.91%	1.71%	1.58%	1.59%
2017	2.72%	2.68%	2.68%	3.96%	3.83%	3.84%	1.64%	1.52%	1.53%
2018	2.68%	2.66%	2.66%	3.92%	3.81%	3.82%	1.60%	1.50%	1.51%
2019	2.58%	2.54%	2.54%	3.82%	3.71%	3.72%	1.51%	1.40%	1.40%
2020	2.54%	2.50%	2.51%	3.78%	3.68%	3.68%	1.47%	1.37%	1.38%
2021	2.44%	2.38%	2.38%	3.68%	3.56%	3.57%	1.37%	1.25%	1.26%
2022	2.43%	2.39%	2.40%	3.68%	3.58%	3.58%	1.37%	1.27%	1.28%
2023	2.39%	2.36%	2.36%	3.63%	3.54%	3.55%	1.33%	1.24%	1.24%
2024	2.33%	2.29%	2.30%	3.58%	3.48%	3.49%	1.27%	1.18%	1.19%
2025	2.29%	2.25%	2.26%	3.54%	3.45%	3.46%	1.23%	1.15%	1.15%
2026	2.25%	2.21%	2.21%	3.50%	3.41%	3.42%	1.19%	1.11%	1.12%
2027	2.23%	2.16%	2.17%	3.47%	3.39%	3.39%	1.17%	1.09%	1.09%
2028	2.15%	2.13%	2.14%	3.41%	3.32%	3.33%	1.11%	1.02%	1.03%
2029	2.03%	2.06%	2.05%	3.29%	3.21%	3.21%	0.99%	0.91%	0.92%
2030	2.00%	1.96%	1.96%	3.26%	3.19%	3.19%	0.96%	0.89%	0.89%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
OREGON**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	39,039,485	33,013,278	72,052,762	39,824,179	33,636,619	73,460,798	38,262,599	32,395,742	70,658,341
2009	40,264,949	33,178,971	73,443,920	41,590,925	34,233,862	75,824,787	39,071,006	32,231,308	71,302,314
2010	41,628,000	33,512,913	75,140,913	43,539,722	35,015,939	78,555,662	39,991,716	32,229,365	72,221,081
2011	43,075,522	33,999,056	77,074,578	45,620,426	35,972,828	81,593,255	40,970,579	32,369,617	73,340,196
2012	44,640,058	34,651,414	79,291,472	47,872,072	37,125,642	84,997,715	42,036,192	32,661,175	74,697,367
2013	46,261,710	35,357,312	81,619,022	50,235,165	38,359,763	88,594,927	43,129,790	32,993,767	76,123,558
2014	47,878,905	36,052,025	83,930,929	52,645,231	39,606,873	92,252,104	44,193,350	33,306,082	77,499,432
2015	49,496,099	36,766,196	86,262,295	55,107,979	40,900,820	96,008,799	45,231,475	33,626,808	78,858,283
2016	51,110,074	37,429,508	88,539,582	57,620,723	42,164,301	99,785,024	46,241,652	33,891,359	80,133,011
2017	52,721,674	38,095,972	90,817,646	60,185,250	43,456,677	103,641,927	47,225,121	34,150,153	81,375,274
2018	54,329,685	38,796,257	93,125,941	62,801,026	44,813,636	107,614,663	48,181,257	34,430,710	82,611,967
2019	55,932,824	39,475,113	95,407,937	65,467,384	46,173,072	111,640,455	49,109,413	34,683,262	83,792,675
2020	57,534,110	40,176,963	97,711,073	68,188,686	47,586,642	115,775,328	50,012,717	34,947,537	84,960,254
2021	59,133,343	40,840,573	99,973,915	70,965,625	48,983,099	119,948,723	50,891,416	35,169,825	86,061,241
2022	60,731,336	41,559,505	102,290,841	73,800,128	50,473,816	124,273,944	51,746,621	35,431,775	87,178,397
2023	62,327,730	42,296,927	104,624,657	76,692,744	52,016,891	128,709,634	52,578,420	35,700,729	88,279,149
2024	63,919,121	43,034,459	106,953,581	79,640,218	53,591,006	133,231,224	53,384,364	35,960,867	89,345,230
2025	65,508,518	43,790,243	109,298,761	82,647,192	55,219,373	137,866,565	54,167,414	36,227,482	90,394,896
2026	67,095,152	44,560,239	111,655,391	85,713,681	56,898,307	142,611,989	54,927,334	36,496,914	91,424,249
2027	68,696,577	45,344,339	114,040,916	88,863,372	58,628,929	147,492,300	55,678,758	36,768,866	92,447,624
2028	70,278,836	46,124,186	116,403,022	92,053,631	60,388,670	152,442,301	56,394,409	37,028,284	93,422,693
2029	71,798,328	46,884,733	118,683,061	95,226,841	62,157,743	157,384,585	57,040,441	37,263,602	94,304,044
2030	73,316,701	47,666,448	120,983,149	98,463,812	63,990,084	162,453,896	57,667,154	37,507,288	95,174,443

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	3.14%	0.50%	1.93%	4.44%	1.78%	3.22%	2.11%	-0.51%	0.91%
2010	3.39%	1.01%	2.31%	4.69%	2.28%	3.60%	2.36%	-0.01%	1.29%
2011	3.48%	1.45%	2.57%	4.78%	2.73%	3.87%	2.45%	0.44%	1.55%
2012	3.63%	1.92%	2.88%	4.94%	3.20%	4.17%	2.60%	0.90%	1.85%
2013	3.63%	2.04%	2.94%	4.94%	3.32%	4.23%	2.60%	1.02%	1.91%
2014	3.50%	1.96%	2.83%	4.80%	3.25%	4.13%	2.47%	0.95%	1.81%
2015	3.38%	1.98%	2.78%	4.68%	3.27%	4.07%	2.35%	0.96%	1.75%
2016	3.26%	1.80%	2.64%	4.56%	3.09%	3.93%	2.23%	0.79%	1.62%
2017	3.15%	1.78%	2.57%	4.45%	3.07%	3.87%	2.13%	0.76%	1.55%
2018	3.05%	1.84%	2.54%	4.35%	3.12%	3.83%	2.02%	0.82%	1.52%
2019	2.95%	1.75%	2.45%	4.25%	3.03%	3.74%	1.93%	0.73%	1.43%
2020	2.86%	1.78%	2.41%	4.16%	3.06%	3.70%	1.84%	0.76%	1.39%
2021	2.78%	1.65%	2.32%	4.07%	2.93%	3.60%	1.76%	0.64%	1.30%
2022	2.70%	1.76%	2.32%	3.99%	3.04%	3.61%	1.68%	0.74%	1.30%
2023	2.63%	1.77%	2.28%	3.92%	3.06%	3.57%	1.61%	0.76%	1.26%
2024	2.55%	1.74%	2.23%	3.84%	3.03%	3.51%	1.53%	0.73%	1.21%
2025	2.49%	1.76%	2.19%	3.78%	3.04%	3.48%	1.47%	0.74%	1.17%
2026	2.42%	1.76%	2.16%	3.71%	3.04%	3.44%	1.40%	0.74%	1.14%
2027	2.39%	1.76%	2.14%	3.67%	3.04%	3.42%	1.37%	0.75%	1.12%
2028	2.30%	1.72%	2.07%	3.59%	3.00%	3.36%	1.29%	0.71%	1.05%
2029	2.16%	1.65%	1.96%	3.45%	2.93%	3.24%	1.15%	0.64%	0.94%
2030	2.11%	1.67%	1.94%	3.40%	2.95%	3.22%	1.10%	0.65%	0.92%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
OREGON

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	55,344	9,140	64,483	55,897	9,231	65,128	54,790	9,048	63,839
2009	57,264	9,292	66,557	58,564	9,503	68,068	56,128	9,108	65,235
2010	59,392	9,473	68,865	61,504	9,810	71,314	57,633	9,193	66,826
2011	61,647	9,684	71,331	64,643	10,155	74,798	59,227	9,304	68,531
2012	64,080	9,923	74,003	68,039	10,536	78,575	60,952	9,439	70,391
2013	66,601	10,176	76,777	71,606	10,940	82,546	62,720	9,583	72,302
2014	69,119	10,428	79,548	75,248	11,353	86,600	64,443	9,723	74,166
2015	71,641	10,683	82,324	78,974	11,777	90,751	66,130	9,861	75,991
2016	74,161	10,939	85,100	82,780	12,211	94,991	67,775	9,997	77,772
2017	76,681	11,196	87,877	86,670	12,654	99,324	69,381	10,130	79,510
2018	79,199	11,454	90,653	90,642	13,109	103,751	70,946	10,260	81,206
2019	81,713	11,713	93,426	94,695	13,574	108,269	72,469	10,388	82,857
2020	84,227	11,974	96,202	98,837	14,051	112,888	73,956	10,514	84,470
2021	86,742	12,237	98,979	103,068	14,540	117,609	75,406	10,638	86,044
2022	89,259	12,503	101,762	107,392	15,043	122,435	76,822	10,761	87,583
2023	91,776	12,771	104,547	111,810	15,559	127,369	78,203	10,882	89,085
2024	94,289	13,041	107,330	116,317	16,088	132,405	79,545	11,002	90,546
2025	96,803	13,314	110,116	120,920	16,631	137,550	80,852	11,120	91,972
2026	99,315	13,589	112,905	125,619	17,188	142,807	82,126	11,237	93,363
2027	101,859	13,868	115,727	130,456	17,762	148,218	83,391	11,354	94,744
2028	104,372	14,150	118,521	135,356	18,350	153,706	84,598	11,469	96,067
2029	106,793	14,424	121,217	140,239	18,941	159,179	85,699	11,575	97,274
2030	109,216	14,702	123,918	145,225	19,549	164,774	86,772	11,681	98,452

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	2.93%	2.66%	2.89%	2.93%	2.66%	2.89%	2.93%	2.66%	2.89%
2009	3.47%	1.67%	3.21%	4.77%	2.95%	4.51%	2.44%	0.66%	2.19%
2010	3.71%	1.95%	3.47%	5.02%	3.23%	4.77%	2.68%	0.93%	2.44%
2011	3.80%	2.23%	3.58%	5.10%	3.51%	4.88%	2.76%	1.21%	2.55%
2012	3.95%	2.47%	3.75%	5.25%	3.76%	5.05%	2.91%	1.45%	2.71%
2013	3.93%	2.54%	3.75%	5.24%	3.83%	5.05%	2.90%	1.52%	2.72%
2014	3.78%	2.48%	3.61%	5.09%	3.77%	4.91%	2.75%	1.46%	2.58%
2015	3.65%	2.45%	3.49%	4.95%	3.73%	4.79%	2.62%	1.43%	2.46%
2016	3.52%	2.40%	3.37%	4.82%	3.68%	4.67%	2.49%	1.38%	2.34%
2017	3.40%	2.35%	3.26%	4.70%	3.63%	4.56%	2.37%	1.33%	2.24%
2018	3.28%	2.30%	3.16%	4.58%	3.59%	4.46%	2.26%	1.29%	2.13%
2019	3.17%	2.26%	3.06%	4.47%	3.55%	4.36%	2.15%	1.25%	2.03%
2020	3.08%	2.23%	2.97%	4.37%	3.51%	4.27%	2.05%	1.21%	1.95%
2021	2.99%	2.20%	2.89%	4.28%	3.48%	4.18%	1.96%	1.18%	1.86%
2022	2.90%	2.17%	2.81%	4.20%	3.46%	4.10%	1.88%	1.16%	1.79%
2023	2.82%	2.14%	2.74%	4.11%	3.43%	4.03%	1.80%	1.13%	1.72%
2024	2.74%	2.12%	2.66%	4.03%	3.40%	3.95%	1.72%	1.10%	1.64%
2025	2.67%	2.09%	2.60%	3.96%	3.37%	3.89%	1.64%	1.07%	1.57%
2026	2.60%	2.07%	2.53%	3.89%	3.35%	3.82%	1.57%	1.05%	1.51%
2027	2.56%	2.05%	2.50%	3.85%	3.34%	3.79%	1.54%	1.04%	1.48%
2028	2.47%	2.03%	2.41%	3.76%	3.31%	3.70%	1.45%	1.02%	1.40%
2029	2.32%	1.94%	2.27%	3.61%	3.22%	3.56%	1.30%	0.92%	1.26%
2030	2.27%	1.93%	2.23%	3.56%	3.21%	3.51%	1.25%	0.92%	1.21%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
WASHINGTON**

Annual Requirements									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	223,740,900	177,496	223,918,396	228,077,602	179,271	228,256,873	219,445,768	175,721	219,621,489
2009	227,792,885	181,167	227,974,052	235,131,238	184,877	235,316,116	221,195,478	177,182	221,372,660
2010	231,935,729	184,968	232,120,697	242,422,025	190,679	242,612,704	222,975,320	178,672	223,153,992
2011	236,466,290	189,067	236,655,356	250,268,090	196,928	250,465,018	225,068,001	180,421	225,248,421
2012	241,018,980	193,221	241,212,201	258,297,469	203,332	258,500,800	227,117,360	182,141	227,299,501
2013	245,601,224	197,410	245,798,634	266,521,194	209,892	266,731,086	229,131,351	183,832	229,315,183
2014	250,177,828	201,592	250,379,420	274,904,422	216,583	275,121,005	231,077,829	185,470	231,263,299
2015	254,781,793	205,820	254,987,613	283,486,856	223,434	283,710,290	232,987,919	187,078	233,174,997
2016	259,365,089	210,042	259,575,131	292,218,444	230,406	292,448,850	234,818,403	188,623	235,007,025
2017	264,029,009	214,322	264,243,331	301,215,944	237,592	301,453,536	236,662,341	190,177	236,852,518
2018	268,683,646	218,632	268,902,277	310,383,219	244,917	310,628,135	238,437,861	191,677	238,629,539
2019	273,327,648	222,936	273,550,584	319,720,726	252,379	319,973,105	240,145,501	193,123	240,338,623
2020	278,036,827	227,241	278,264,068	329,320,530	260,052	329,580,583	241,852,670	194,567	242,047,238
2021	282,775,826	231,587	283,007,413	339,146,630	267,908	339,414,538	243,528,081	195,986	243,724,067
2022	287,410,820	235,861	287,646,681	349,042,761	275,823	349,318,584	245,056,655	197,286	245,253,941
2023	292,028,577	240,136	292,268,713	359,113,286	283,879	359,397,165	246,515,967	198,530	246,714,497
2024	296,658,346	244,427	296,902,772	369,396,387	292,108	369,688,494	247,932,364	199,739	248,132,103
2025	301,268,652	248,713	301,517,365	379,857,124	300,481	380,157,605	249,279,879	200,893	249,480,772
2026	305,860,044	252,992	306,113,036	390,498,555	309,001	390,807,556	250,560,466	201,992	250,762,457
2027	310,452,953	257,293	310,710,245	401,349,685	317,690	401,667,375	251,792,065	203,051	251,995,116
2028	315,119,203	261,667	315,380,870	412,506,981	326,627	412,833,607	253,033,906	204,118	253,238,024
2029	319,830,487	266,105	320,096,592	423,941,200	335,788	424,276,987	254,261,918	205,175	254,467,093
2030	324,541,111	270,537	324,811,649	435,597,271	345,137	435,942,407	255,439,690	206,195	255,645,885

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential	Comm./ Ind.	Total	Residential	Comm./ Ind.	Total	Residential	Comm./ Ind.	Total
	Therms Growth	Therms Growth	Therms Growth	Therms Growth	Therms Growth	Therms Growth	Therms Growth	Therms Growth	Therms Growth
2008	0.15%	-0.06%	0.15%	1.08%	-0.06%	1.08%	-0.78%	-0.06%	-0.78%
2009	1.81%	2.07%	1.81%	3.09%	3.13%	3.09%	0.80%	0.83%	0.80%
2010	1.82%	2.10%	1.82%	3.10%	3.14%	3.10%	0.80%	0.84%	0.80%
2011	1.95%	2.22%	1.95%	3.24%	3.28%	3.24%	0.94%	0.98%	0.94%
2012	1.93%	2.20%	1.93%	3.21%	3.25%	3.21%	0.91%	0.95%	0.91%
2013	1.90%	2.17%	1.90%	3.18%	3.23%	3.18%	0.89%	0.93%	0.89%
2014	1.86%	2.12%	1.86%	3.15%	3.19%	3.15%	0.85%	0.89%	0.85%
2015	1.84%	2.10%	1.84%	3.12%	3.16%	3.12%	0.83%	0.87%	0.83%
2016	1.80%	2.05%	1.80%	3.08%	3.12%	3.08%	0.79%	0.83%	0.79%
2017	1.80%	2.04%	1.80%	3.08%	3.12%	3.08%	0.79%	0.82%	0.79%
2018	1.76%	2.01%	1.76%	3.04%	3.08%	3.04%	0.75%	0.79%	0.75%
2019	1.73%	1.97%	1.73%	3.01%	3.05%	3.01%	0.72%	0.75%	0.72%
2020	1.72%	1.93%	1.72%	3.00%	3.04%	3.00%	0.71%	0.75%	0.71%
2021	1.70%	1.91%	1.70%	2.98%	3.02%	2.98%	0.69%	0.73%	0.69%
2022	1.64%	1.85%	1.64%	2.92%	2.95%	2.92%	0.63%	0.66%	0.63%
2023	1.61%	1.81%	1.61%	2.89%	2.92%	2.89%	0.60%	0.63%	0.60%
2024	1.59%	1.79%	1.59%	2.86%	2.90%	2.86%	0.57%	0.61%	0.57%
2025	1.55%	1.75%	1.55%	2.83%	2.87%	2.83%	0.54%	0.58%	0.54%
2026	1.52%	1.72%	1.52%	2.80%	2.84%	2.80%	0.51%	0.55%	0.51%
2027	1.50%	1.70%	1.50%	2.78%	2.81%	2.78%	0.49%	0.52%	0.49%
2028	1.50%	1.70%	1.50%	2.78%	2.81%	2.78%	0.49%	0.53%	0.49%
2029	1.50%	1.70%	1.50%	2.77%	2.80%	2.77%	0.49%	0.52%	0.49%
2030	1.47%	1.67%	1.47%	2.75%	2.78%	2.75%	0.46%	0.50%	0.46%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
WASHINGTON**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	177,496	2,325,318	2,502,814	179,271	2,348,571	2,527,842	175,721	2,302,065	2,477,785
2009	181,167	2,371,433	2,552,599	184,877	2,422,677	2,607,555	177,182	2,321,840	2,499,022
2010	184,968	2,419,256	2,604,224	190,679	2,499,297	2,689,975	178,672	2,341,935	2,520,607
2011	189,067	2,470,707	2,659,774	196,928	2,581,600	2,778,528	180,421	2,365,216	2,545,637
2012	193,221	2,524,003	2,717,224	203,332	2,665,718	2,869,050	182,141	2,387,918	2,570,059
2013	197,410	2,578,330	2,775,739	209,892	2,751,858	2,961,750	183,832	2,410,211	2,594,043
2014	201,592	2,633,083	2,834,675	216,583	2,839,679	3,056,262	185,470	2,431,775	2,617,245
2015	205,820	2,687,729	2,893,549	223,434	2,929,567	3,153,001	187,078	2,452,916	2,639,994
2016	210,042	2,742,603	2,952,645	230,406	3,021,004	3,251,410	188,623	2,473,180	2,661,803
2017	214,322	2,798,271	3,012,594	237,592	3,115,272	3,352,864	190,177	2,493,609	2,683,787
2018	218,632	2,853,800	3,072,432	244,917	3,211,280	3,456,196	191,677	2,513,262	2,704,939
2019	222,936	2,909,911	3,132,847	252,379	3,309,088	3,561,467	193,123	2,532,188	2,725,310
2020	227,241	2,965,812	3,193,052	260,052	3,409,685	3,669,738	194,567	2,551,124	2,745,691
2021	231,587	3,022,401	3,253,988	267,908	3,512,684	3,780,592	195,986	2,569,728	2,765,714
2022	235,861	3,077,532	3,313,394	275,823	3,616,300	3,892,123	197,286	2,586,665	2,783,951
2023	240,136	3,132,469	3,372,604	283,879	3,721,706	4,005,585	198,530	2,602,822	2,801,352
2024	244,427	3,188,078	3,432,504	292,108	3,829,374	4,121,482	199,739	2,618,535	2,818,274
2025	248,713	3,243,124	3,491,837	300,481	3,938,860	4,239,341	200,893	2,633,470	2,834,363
2026	252,992	3,298,111	3,551,103	309,001	4,050,212	4,359,213	201,992	2,647,664	2,849,656
2027	257,293	3,353,080	3,610,373	317,690	4,163,730	4,481,421	203,051	2,661,304	2,864,356
2028	261,667	3,409,392	3,671,058	326,627	4,280,536	4,607,163	204,118	2,675,097	2,879,216
2029	266,105	3,466,486	3,732,591	335,788	4,400,363	4,736,151	205,175	2,688,804	2,893,979
2030	270,537	3,522,256	3,792,794	345,137	4,522,232	4,867,369	206,195	2,701,793	2,907,988

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	-0.06%	-9.97%	-9.33%	-0.06%	-9.97%	-9.33%	-0.06%	-9.97%	-9.33%
2009	2.07%	1.98%	1.99%	3.13%	3.16%	3.15%	0.83%	0.86%	0.86%
2010	2.10%	2.02%	2.02%	3.14%	3.16%	3.16%	0.84%	0.87%	0.86%
2011	2.22%	2.13%	2.13%	3.28%	3.29%	3.29%	0.98%	0.99%	0.99%
2012	2.20%	2.16%	2.16%	3.25%	3.26%	3.26%	0.95%	0.96%	0.96%
2013	2.17%	2.15%	2.15%	3.23%	3.23%	3.23%	0.93%	0.93%	0.93%
2014	2.12%	2.12%	2.12%	3.19%	3.19%	3.19%	0.89%	0.89%	0.89%
2015	2.10%	2.08%	2.08%	3.16%	3.17%	3.17%	0.87%	0.87%	0.87%
2016	2.05%	2.04%	2.04%	3.12%	3.12%	3.12%	0.83%	0.83%	0.83%
2017	2.04%	2.03%	2.03%	3.12%	3.12%	3.12%	0.82%	0.83%	0.83%
2018	2.01%	1.98%	1.99%	3.08%	3.08%	3.08%	0.79%	0.79%	0.79%
2019	1.97%	1.97%	1.97%	3.05%	3.05%	3.05%	0.75%	0.75%	0.75%
2020	1.93%	1.92%	1.92%	3.04%	3.04%	3.04%	0.75%	0.75%	0.75%
2021	1.91%	1.91%	1.91%	3.02%	3.02%	3.02%	0.73%	0.73%	0.73%
2022	1.85%	1.82%	1.83%	2.95%	2.95%	2.95%	0.66%	0.66%	0.66%
2023	1.81%	1.79%	1.79%	2.92%	2.91%	2.92%	0.63%	0.62%	0.63%
2024	1.79%	1.78%	1.78%	2.90%	2.89%	2.89%	0.61%	0.60%	0.60%
2025	1.75%	1.73%	1.73%	2.87%	2.86%	2.86%	0.58%	0.57%	0.57%
2026	1.72%	1.70%	1.70%	2.84%	2.83%	2.83%	0.55%	0.54%	0.54%
2027	1.70%	1.67%	1.67%	2.81%	2.80%	2.80%	0.52%	0.52%	0.52%
2028	1.70%	1.68%	1.68%	2.81%	2.81%	2.81%	0.53%	0.52%	0.52%
2029	1.70%	1.67%	1.68%	2.80%	2.80%	2.80%	0.52%	0.51%	0.51%
2030	1.67%	1.61%	1.61%	2.78%	2.77%	2.77%	0.50%	0.48%	0.48%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
WASHINGTON**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	118,565,796	105,352,600	223,918,396	120,948,968	107,307,904	228,256,873	116,206,337	103,415,152	219,621,489
2009	121,126,123	106,847,929	227,974,052	125,114,962	110,201,154	235,316,116	117,534,472	103,838,187	221,372,660
2010	123,847,175	108,273,523	232,120,697	129,534,727	113,077,977	242,612,704	118,979,079	104,174,913	223,153,992
2011	126,746,278	109,909,079	236,655,356	134,234,455	116,230,563	250,465,018	120,552,652	104,695,769	225,248,421
2012	129,709,556	111,502,645	241,212,201	139,100,741	119,400,059	258,500,800	122,143,562	105,155,939	227,299,501
2013	132,690,200	113,108,434	245,798,634	144,087,067	122,644,019	266,731,086	123,707,068	105,608,115	229,315,183
2014	135,659,984	114,719,436	250,379,420	149,164,884	125,956,121	275,121,005	125,217,342	106,045,957	231,263,299
2015	138,652,429	116,335,184	254,987,613	154,372,876	129,337,414	283,710,290	126,706,022	106,468,975	233,174,997
2016	141,642,634	117,932,497	259,575,131	159,685,760	132,763,090	292,448,850	128,150,653	106,856,372	235,007,025
2017	144,640,137	119,603,195	264,243,331	165,116,206	136,337,331	301,453,536	129,560,528	107,291,990	236,852,518
2018	147,672,886	121,229,391	268,902,277	170,698,742	139,929,393	310,628,135	130,960,916	107,668,623	238,629,539
2019	150,691,977	122,858,608	273,550,584	176,379,606	143,593,499	319,973,105	132,308,616	108,030,008	240,338,623
2020	153,721,810	124,542,258	278,264,068	182,189,108	147,391,475	329,580,583	133,625,868	108,421,369	242,047,238
2021	156,756,471	126,250,942	283,007,413	188,122,646	151,291,892	339,414,538	134,907,963	108,816,104	243,724,067
2022	159,800,896	127,845,785	287,646,681	194,188,494	155,130,090	349,318,584	136,159,633	109,094,308	245,253,941
2023	162,855,436	129,413,277	292,268,713	200,389,620	159,007,545	359,397,165	137,381,570	109,332,927	246,714,497
2024	165,898,145	131,004,627	296,902,772	206,701,284	162,987,210	369,688,494	138,555,829	109,576,274	248,132,103
2025	168,949,633	132,567,733	301,517,365	213,151,099	167,006,506	380,157,605	139,700,377	109,780,395	249,480,772
2026	172,001,528	134,111,508	306,113,036	219,730,989	171,076,566	390,807,556	140,808,764	109,953,693	250,762,457
2027	175,065,373	135,644,873	310,710,245	226,458,142	175,209,233	401,667,375	141,890,948	110,104,168	251,995,116
2028	178,127,138	137,253,731	315,380,870	233,317,041	179,516,567	412,833,607	142,935,987	110,302,038	253,238,024
2029	181,184,539	138,912,053	320,096,592	240,306,869	183,970,119	424,276,987	143,942,713	110,524,380	254,467,093
2030	184,328,119	140,483,530	324,811,649	247,551,362	188,391,045	435,942,407	144,983,037	110,662,848	255,645,885

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	2.16%	1.42%	1.81%	3.44%	2.70%	3.09%	1.14%	0.41%	0.80%
2010	2.25%	1.33%	1.82%	3.53%	2.61%	3.10%	1.23%	0.32%	0.80%
2011	2.34%	1.51%	1.95%	3.63%	2.79%	3.24%	1.32%	0.50%	0.94%
2012	2.34%	1.45%	1.93%	3.63%	2.73%	3.21%	1.32%	0.44%	0.91%
2013	2.30%	1.44%	1.90%	3.58%	2.72%	3.18%	1.28%	0.43%	0.89%
2014	2.24%	1.42%	1.86%	3.52%	2.70%	3.15%	1.22%	0.41%	0.85%
2015	2.21%	1.41%	1.84%	3.49%	2.68%	3.12%	1.19%	0.40%	0.83%
2016	2.16%	1.37%	1.80%	3.44%	2.65%	3.08%	1.14%	0.36%	0.79%
2017	2.12%	1.42%	1.80%	3.40%	2.69%	3.08%	1.10%	0.41%	0.79%
2018	2.10%	1.36%	1.76%	3.38%	2.63%	3.04%	1.08%	0.35%	0.75%
2019	2.04%	1.34%	1.73%	3.33%	2.62%	3.01%	1.03%	0.34%	0.72%
2020	2.01%	1.37%	1.72%	3.29%	2.64%	3.00%	1.00%	0.36%	0.71%
2021	1.97%	1.37%	1.70%	3.26%	2.65%	2.98%	0.96%	0.36%	0.69%
2022	1.94%	1.26%	1.64%	3.22%	2.54%	2.92%	0.93%	0.26%	0.63%
2023	1.91%	1.23%	1.61%	3.19%	2.50%	2.89%	0.90%	0.22%	0.60%
2024	1.87%	1.23%	1.59%	3.15%	2.50%	2.86%	0.85%	0.22%	0.57%
2025	1.84%	1.19%	1.55%	3.12%	2.47%	2.83%	0.83%	0.19%	0.54%
2026	1.81%	1.16%	1.52%	3.09%	2.44%	2.80%	0.79%	0.16%	0.51%
2027	1.78%	1.14%	1.50%	3.06%	2.42%	2.78%	0.77%	0.14%	0.49%
2028	1.75%	1.19%	1.50%	3.03%	2.46%	2.78%	0.74%	0.18%	0.49%
2029	1.72%	1.21%	1.50%	3.00%	2.48%	2.77%	0.70%	0.20%	0.49%
2030	1.74%	1.13%	1.47%	3.01%	2.40%	2.75%	0.72%	0.13%	0.46%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
WASHINGTON

Year	Customer Forecast								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	167,921	24,191	192,112	169,600	24,433	194,033	166,242	23,949	190,191
2009	171,867	24,604	196,471	175,769	25,163	200,932	168,455	24,116	192,571
2010	176,056	25,018	201,074	182,318	25,908	208,226	170,844	24,278	195,122
2011	180,491	25,458	205,949	189,262	26,695	215,957	173,405	24,458	197,864
2012	185,023	25,901	210,924	196,454	27,501	223,956	175,990	24,637	200,627
2013	189,589	26,346	215,935	203,835	28,325	232,160	178,539	24,810	203,349
2014	194,150	26,786	220,937	211,364	29,161	240,525	181,016	24,974	205,990
2015	198,754	27,229	225,983	219,098	30,016	249,114	183,464	25,134	208,598
2016	203,364	27,670	231,035	227,000	30,886	257,886	185,852	25,287	211,139
2017	207,996	28,111	236,106	235,090	31,772	266,862	188,193	25,434	213,627
2018	212,686	28,549	241,235	243,414	32,674	276,088	190,521	25,574	216,096
2019	217,367	28,984	246,351	251,901	33,589	285,490	192,777	25,705	218,483
2020	222,074	29,420	251,494	260,593	34,523	295,116	194,992	25,832	220,824
2021	226,799	29,854	256,653	269,485	35,473	304,958	197,159	25,953	223,112
2022	231,547	30,290	261,837	278,588	36,443	315,031	199,285	26,069	225,354
2023	236,322	30,726	267,047	287,909	37,433	325,341	201,370	26,181	227,551
2024	241,090	31,159	272,248	297,412	38,438	335,850	203,389	26,286	229,675
2025	245,881	31,593	277,474	307,138	39,464	346,602	205,367	26,387	231,754
2026	250,684	32,026	282,710	317,076	40,509	357,585	207,295	26,483	233,778
2027	255,514	32,461	287,976	327,251	41,575	368,826	209,187	26,576	235,763
2028	260,353	32,896	293,248	337,642	42,661	380,303	211,027	26,663	237,690
2029	265,196	33,342	298,538	348,249	43,784	392,034	212,814	26,756	239,570
2030	270,167	33,777	303,944	359,239	44,914	404,153	214,646	26,836	241,482

Year	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	2.22%	1.80%	2.17%	2.22%	1.80%	2.17%	2.22%	1.80%	2.17%
2009	2.35%	1.71%	2.27%	3.64%	2.99%	3.56%	1.33%	0.70%	1.25%
2010	2.44%	1.68%	2.34%	3.73%	2.96%	3.63%	1.42%	0.67%	1.32%
2011	2.52%	1.76%	2.42%	3.81%	3.04%	3.71%	1.50%	0.74%	1.41%
2012	2.51%	1.74%	2.42%	3.80%	3.02%	3.70%	1.49%	0.73%	1.40%
2013	2.47%	1.72%	2.38%	3.76%	3.00%	3.66%	1.45%	0.70%	1.36%
2014	2.41%	1.67%	2.32%	3.69%	2.95%	3.60%	1.39%	0.66%	1.30%
2015	2.37%	1.65%	2.28%	3.66%	2.93%	3.57%	1.35%	0.64%	1.27%
2016	2.32%	1.62%	2.24%	3.61%	2.90%	3.52%	1.30%	0.61%	1.22%
2017	2.28%	1.59%	2.20%	3.56%	2.87%	3.48%	1.26%	0.58%	1.18%
2018	2.25%	1.56%	2.17%	3.54%	2.84%	3.46%	1.24%	0.55%	1.16%
2019	2.20%	1.52%	2.12%	3.49%	2.80%	3.41%	1.18%	0.51%	1.10%
2020	2.17%	1.50%	2.09%	3.45%	2.78%	3.37%	1.15%	0.49%	1.07%
2021	2.13%	1.48%	2.05%	3.41%	2.75%	3.34%	1.11%	0.47%	1.04%
2022	2.09%	1.46%	2.02%	3.38%	2.73%	3.30%	1.08%	0.45%	1.00%
2023	2.06%	1.44%	1.99%	3.35%	2.72%	3.27%	1.05%	0.43%	0.97%
2024	2.02%	1.41%	1.95%	3.30%	2.69%	3.23%	1.00%	0.40%	0.93%
2025	1.99%	1.39%	1.92%	3.27%	2.67%	3.20%	0.97%	0.38%	0.91%
2026	1.95%	1.37%	1.89%	3.24%	2.65%	3.17%	0.94%	0.36%	0.87%
2027	1.93%	1.36%	1.86%	3.21%	2.63%	3.14%	0.91%	0.35%	0.85%
2028	1.89%	1.34%	1.83%	3.18%	2.61%	3.11%	0.88%	0.33%	0.82%
2029	1.86%	1.36%	1.80%	3.14%	2.63%	3.08%	0.85%	0.35%	0.79%
2030	1.87%	1.30%	1.81%	3.16%	2.58%	3.09%	0.86%	0.30%	0.80%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE 10**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	9,573,749	6,797	9,580,546	9,751,460	6,865	9,758,325	9,397,661	6,729	9,404,390
2009	9,649,179	6,862	9,656,041	9,952,133	7,006	9,959,139	9,377,273	6,714	9,383,987
2010	9,728,232	6,929	9,735,161	10,160,153	7,153	10,167,305	9,359,789	6,702	9,366,491
2011	9,821,880	7,007	9,828,887	10,386,926	7,312	10,394,238	9,355,941	6,699	9,362,640
2012	9,915,933	7,085	9,923,019	10,618,227	7,475	10,625,702	9,351,629	6,696	9,358,324
2013	10,009,938	7,165	10,017,103	10,853,651	7,641	10,861,292	9,346,432	6,692	9,353,124
2014	10,099,630	7,241	10,106,871	11,088,578	7,806	11,096,384	9,336,429	6,685	9,343,114
2015	10,190,364	7,317	10,197,681	11,328,855	7,975	11,336,830	9,326,653	6,678	9,333,331
2016	10,278,392	7,393	10,285,785	11,570,374	8,145	11,578,519	9,313,700	6,669	9,320,369
2017	10,364,899	7,467	10,372,366	11,814,443	8,317	11,822,760	9,298,716	6,658	9,305,374
2018	10,449,115	7,540	10,456,655	12,060,173	8,490	12,068,663	9,281,078	6,645	9,287,724
2019	10,529,521	7,611	10,537,132	12,305,759	8,663	12,314,422	9,259,523	6,630	9,266,153
2020	10,609,328	7,681	10,617,010	12,554,908	8,838	12,563,746	9,236,956	6,614	9,243,570
2021	10,687,789	7,751	10,695,540	12,806,762	9,016	12,815,778	9,212,762	6,596	9,219,359
2022	10,766,456	7,821	10,774,277	13,063,211	9,196	13,072,407	9,188,315	6,579	9,194,894
2023	10,844,712	7,891	10,852,603	13,323,578	9,380	13,332,958	9,163,098	6,561	9,169,659
2024	10,919,999	7,959	10,927,958	13,584,732	9,563	13,594,296	9,134,990	6,541	9,141,531
2025	10,994,806	8,027	11,002,833	13,849,741	9,750	13,859,490	9,106,140	6,520	9,112,660
2026	11,068,225	8,094	11,076,319	14,117,494	9,938	14,127,432	9,075,823	6,498	9,082,322
2027	11,141,531	8,161	11,149,692	14,389,644	10,130	14,399,774	9,045,117	6,476	9,051,594
2028	11,212,906	8,227	11,221,134	14,663,883	10,323	14,674,207	9,012,573	6,453	9,019,026
2029	11,282,513	8,292	11,290,805	14,940,399	10,518	14,950,917	8,978,375	6,429	8,984,804
2030	11,352,291	8,357	11,360,648	15,221,779	10,716	15,232,494	8,944,102	6,404	8,950,506

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	-1.96%	-36.56%	-2.00%	-1.13%	-36.56%	-1.17%	-2.79%	-36.56%	-2.83%
2009	0.79%	0.95%	0.79%	2.06%	2.06%	2.06%	-0.22%	-0.22%	-0.22%
2010	0.82%	0.98%	0.82%	2.09%	2.09%	2.09%	-0.19%	-0.19%	-0.19%
2011	0.96%	1.12%	0.96%	2.23%	2.23%	2.23%	-0.04%	-0.04%	-0.04%
2012	0.96%	1.12%	0.96%	2.23%	2.23%	2.23%	-0.05%	-0.05%	-0.05%
2013	0.95%	1.12%	0.95%	2.22%	2.22%	2.22%	-0.06%	-0.06%	-0.06%
2014	0.90%	1.06%	0.90%	2.16%	2.16%	2.16%	-0.11%	-0.11%	-0.11%
2015	0.90%	1.06%	0.90%	2.17%	2.17%	2.17%	-0.10%	-0.10%	-0.10%
2016	0.86%	1.03%	0.86%	2.13%	2.13%	2.13%	-0.14%	-0.14%	-0.14%
2017	0.84%	1.00%	0.84%	2.11%	2.11%	2.11%	-0.16%	-0.16%	-0.16%
2018	0.81%	0.99%	0.81%	2.08%	2.08%	2.08%	-0.19%	-0.19%	-0.19%
2019	0.77%	0.94%	0.77%	2.04%	2.04%	2.04%	-0.23%	-0.23%	-0.23%
2020	0.76%	0.92%	0.76%	2.02%	2.02%	2.02%	-0.24%	-0.24%	-0.24%
2021	0.74%	0.90%	0.74%	2.01%	2.01%	2.01%	-0.26%	-0.26%	-0.26%
2022	0.74%	0.90%	0.74%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2023	0.73%	0.90%	0.73%	1.99%	1.99%	1.99%	-0.27%	-0.27%	-0.27%
2024	0.69%	0.86%	0.69%	1.96%	1.96%	1.96%	-0.31%	-0.31%	-0.31%
2025	0.69%	0.85%	0.69%	1.95%	1.95%	1.95%	-0.32%	-0.32%	-0.32%
2026	0.67%	0.83%	0.67%	1.93%	1.93%	1.93%	-0.33%	-0.33%	-0.33%
2027	0.66%	0.83%	0.66%	1.93%	1.93%	1.93%	-0.34%	-0.34%	-0.34%
2028	0.64%	0.82%	0.64%	1.91%	1.91%	1.91%	-0.36%	-0.36%	-0.36%
2029	0.62%	0.79%	0.62%	1.89%	1.89%	1.89%	-0.38%	-0.38%	-0.38%
2030	0.62%	0.78%	0.62%	1.88%	1.88%	1.88%	-0.38%	-0.38%	-0.38%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE 10**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	6,797	89,713	96,510	6,865	90,610	97,475	6,729	88,816	95,544
2009	6,862	90,645	97,507	7,006	92,474	99,481	6,714	88,623	95,337
2010	6,929	91,361	98,290	7,153	94,407	101,560	6,702	88,458	95,159
2011	7,007	92,643	99,650	7,312	96,514	103,827	6,699	88,421	95,120
2012	7,085	93,660	100,745	7,475	98,664	106,139	6,696	88,380	95,076
2013	7,165	94,686	101,851	7,641	100,851	108,492	6,692	88,331	95,024
2014	7,241	95,720	102,961	7,806	103,034	110,840	6,685	88,237	94,922
2015	7,317	96,711	104,028	7,975	105,267	113,242	6,678	88,144	94,822
2016	7,393	97,708	105,101	8,145	107,511	115,656	6,669	88,022	94,691
2017	7,467	98,685	106,152	8,317	109,779	118,096	6,658	87,880	94,538
2018	7,540	99,652	107,192	8,490	112,062	120,552	6,645	87,714	94,359
2019	7,611	100,608	108,219	8,663	114,344	123,007	6,630	87,510	94,140
2020	7,681	101,524	109,205	8,838	116,659	125,498	6,614	87,297	93,911
2021	7,751	102,437	110,188	9,016	118,999	128,015	6,596	87,068	93,665
2022	7,821	103,344	111,164	9,196	121,382	130,579	6,579	86,837	93,416
2023	7,891	104,249	112,140	9,380	123,802	133,181	6,561	86,599	93,160
2024	7,959	105,162	113,121	9,563	126,228	135,792	6,541	86,333	92,874
2025	8,027	106,045	114,072	9,750	128,691	138,441	6,520	86,060	92,581
2026	8,094	106,925	115,019	9,938	131,179	141,117	6,498	85,774	92,272
2027	8,161	107,794	115,955	10,130	133,707	143,837	6,476	85,484	91,960
2028	8,227	108,656	116,884	10,323	136,256	146,579	6,453	85,176	91,629
2029	8,292	109,518	117,810	10,518	138,825	149,343	6,429	84,853	91,282
2030	8,357	110,357	118,713	10,716	141,440	152,155	6,404	84,529	90,933

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	-36.56%	-14.24%	-16.31%	-36.56%	-14.24%	-16.31%	-36.56%	-14.24%	-16.31%
2009	0.95%	1.04%	1.03%	2.06%	2.06%	2.06%	-0.22%	-0.22%	-0.22%
2010	0.98%	0.79%	0.80%	2.09%	2.09%	2.09%	-0.19%	-0.19%	-0.19%
2011	1.12%	1.40%	1.38%	2.23%	2.23%	2.23%	-0.04%	-0.04%	-0.04%
2012	1.12%	1.10%	1.10%	2.23%	2.23%	2.23%	-0.05%	-0.05%	-0.05%
2013	1.12%	1.10%	1.10%	2.22%	2.22%	2.22%	-0.06%	-0.06%	-0.06%
2014	1.06%	1.09%	1.09%	2.16%	2.16%	2.16%	-0.11%	-0.11%	-0.11%
2015	1.06%	1.03%	1.04%	2.17%	2.17%	2.17%	-0.10%	-0.10%	-0.10%
2016	1.03%	1.03%	1.03%	2.13%	2.13%	2.13%	-0.14%	-0.14%	-0.14%
2017	1.00%	1.00%	1.00%	2.11%	2.11%	2.11%	-0.16%	-0.16%	-0.16%
2018	0.99%	0.98%	0.98%	2.08%	2.08%	2.08%	-0.19%	-0.19%	-0.19%
2019	0.94%	0.96%	0.96%	2.04%	2.04%	2.04%	-0.23%	-0.23%	-0.23%
2020	0.92%	0.91%	0.91%	2.02%	2.02%	2.02%	-0.24%	-0.24%	-0.24%
2021	0.90%	0.90%	0.90%	2.01%	2.01%	2.01%	-0.26%	-0.26%	-0.26%
2022	0.90%	0.89%	0.89%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2023	0.90%	0.88%	0.88%	1.99%	1.99%	1.99%	-0.27%	-0.27%	-0.27%
2024	0.86%	0.88%	0.87%	1.96%	1.96%	1.96%	-0.31%	-0.31%	-0.31%
2025	0.85%	0.84%	0.84%	1.95%	1.95%	1.95%	-0.32%	-0.32%	-0.32%
2026	0.83%	0.83%	0.83%	1.93%	1.93%	1.93%	-0.33%	-0.33%	-0.33%
2027	0.83%	0.81%	0.81%	1.93%	1.93%	1.93%	-0.34%	-0.34%	-0.34%
2028	0.82%	0.80%	0.80%	1.91%	1.91%	1.91%	-0.36%	-0.36%	-0.36%
2029	0.79%	0.79%	0.79%	1.89%	1.89%	1.89%	-0.38%	-0.38%	-0.38%
2030	0.78%	0.77%	0.77%	1.88%	1.88%	1.88%	-0.38%	-0.38%	-0.38%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE 11**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	3,211,234	6,369,312	9,580,546	3,275,780	6,482,545	9,758,325	3,147,330	6,257,060	9,404,390
2009	3,252,062	6,403,979	9,656,041	3,359,157	6,599,982	9,959,139	3,155,631	6,228,356	9,383,987
2010	3,301,036	6,434,125	9,735,161	3,452,633	6,714,673	10,167,305	3,171,281	6,195,210	9,366,491
2011	3,337,791	6,491,095	9,828,887	3,534,988	6,859,249	10,394,238	3,174,686	6,187,954	9,362,640
2012	3,374,707	6,548,312	9,923,019	3,619,041	7,006,660	10,625,702	3,177,859	6,180,465	9,358,324
2013	3,411,741	6,605,362	10,017,103	3,704,778	7,156,514	10,861,292	3,180,766	6,172,358	9,353,124
2014	3,447,595	6,659,276	10,106,871	3,790,802	7,305,582	11,096,384	3,182,211	6,160,903	9,343,114
2015	3,483,859	6,713,822	10,197,681	3,878,860	7,457,970	11,336,830	3,183,687	6,149,644	9,333,331
2016	3,519,348	6,766,437	10,285,785	3,967,660	7,610,859	11,578,519	3,184,117	6,136,252	9,320,369
2017	3,554,541	6,817,825	10,372,366	4,057,741	7,765,018	11,822,760	3,183,958	6,121,415	9,305,374
2018	3,589,001	6,867,654	10,456,655	4,148,615	7,920,048	12,068,663	3,182,838	6,104,885	9,287,724
2019	3,622,306	6,914,826	10,537,132	4,239,781	8,074,641	12,314,422	3,180,410	6,085,742	9,266,153
2020	3,655,513	6,961,497	10,617,010	4,332,467	8,231,279	12,563,746	3,177,631	6,065,939	9,243,570
2021	3,688,331	7,007,209	10,695,540	4,426,347	8,389,431	12,815,778	3,174,256	6,045,103	9,219,359
2022	3,721,089	7,053,188	10,774,277	4,521,831	8,550,576	13,072,407	3,170,583	6,024,311	9,194,894
2023	3,753,690	7,098,913	10,852,603	4,618,824	8,714,134	13,332,958	3,166,538	6,003,121	9,169,659
2024	3,785,354	7,142,604	10,927,958	4,716,373	8,877,922	13,594,296	3,161,475	5,980,056	9,141,531
2025	3,816,814	7,186,018	11,002,833	4,815,389	9,044,102	13,859,490	3,156,032	5,956,628	9,112,660
2026	3,847,783	7,228,535	11,076,319	4,915,522	9,211,910	14,127,432	3,149,981	5,932,340	9,082,322
2027	3,878,694	7,270,998	11,149,692	5,017,336	9,382,438	14,399,774	3,143,692	5,907,902	9,051,594
2028	3,909,030	7,312,103	11,221,134	5,120,182	9,554,024	14,674,207	3,136,755	5,882,272	9,019,026
2029	3,938,730	7,352,075	11,290,805	5,223,977	9,726,940	14,950,917	3,129,138	5,855,665	8,984,804
2030	3,968,424	7,392,224	11,360,648	5,329,566	9,902,928	15,232,494	3,121,359	5,829,147	8,950,506

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	1.27%	0.54%	0.79%	2.55%	1.81%	2.06%	0.26%	-0.46%	-0.22%
2010	1.51%	0.47%	0.82%	2.78%	1.74%	2.09%	0.50%	-0.53%	-0.19%
2011	1.11%	0.89%	0.96%	2.39%	2.15%	2.23%	0.11%	-0.12%	-0.04%
2012	1.11%	0.88%	0.96%	2.38%	2.15%	2.23%	0.10%	-0.12%	-0.05%
2013	1.10%	0.87%	0.95%	2.37%	2.14%	2.22%	0.09%	-0.13%	-0.06%
2014	1.05%	0.82%	0.90%	2.32%	2.08%	2.16%	0.05%	-0.19%	-0.11%
2015	1.05%	0.82%	0.90%	2.32%	2.09%	2.17%	0.05%	-0.18%	-0.10%
2016	1.02%	0.78%	0.86%	2.29%	2.05%	2.13%	0.01%	-0.22%	-0.14%
2017	1.00%	0.76%	0.84%	2.27%	2.03%	2.11%	0.00%	-0.24%	-0.16%
2018	0.97%	0.73%	0.81%	2.24%	2.00%	2.08%	-0.04%	-0.27%	-0.19%
2019	0.93%	0.69%	0.77%	2.20%	1.95%	2.04%	-0.08%	-0.31%	-0.23%
2020	0.92%	0.67%	0.76%	2.19%	1.94%	2.02%	-0.09%	-0.33%	-0.24%
2021	0.90%	0.66%	0.74%	2.17%	1.92%	2.01%	-0.11%	-0.34%	-0.26%
2022	0.89%	0.66%	0.74%	2.16%	1.92%	2.00%	-0.12%	-0.34%	-0.27%
2023	0.88%	0.65%	0.73%	2.14%	1.91%	1.99%	-0.13%	-0.35%	-0.27%
2024	0.84%	0.62%	0.69%	2.11%	1.88%	1.96%	-0.16%	-0.38%	-0.31%
2025	0.83%	0.61%	0.69%	2.10%	1.87%	1.95%	-0.17%	-0.39%	-0.32%
2026	0.81%	0.59%	0.67%	2.08%	1.86%	1.93%	-0.19%	-0.41%	-0.33%
2027	0.80%	0.59%	0.66%	2.07%	1.85%	1.93%	-0.20%	-0.41%	-0.34%
2028	0.78%	0.57%	0.64%	2.05%	1.83%	1.91%	-0.22%	-0.43%	-0.36%
2029	0.76%	0.55%	0.62%	2.03%	1.81%	1.89%	-0.24%	-0.45%	-0.38%
2030	0.75%	0.55%	0.62%	2.02%	1.81%	1.88%	-0.25%	-0.45%	-0.38%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE 10

Year	Customer Forecast								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	5,361	1,397	6,758	5,415	1,411	6,826	5,307	1,383	6,691
2009	5,441	1,411	6,852	5,564	1,443	7,007	5,333	1,383	6,716
2010	5,534	1,426	6,960	5,731	1,476	7,207	5,370	1,383	6,753
2011	5,607	1,439	7,046	5,880	1,509	7,388	5,387	1,382	6,769
2012	5,681	1,452	7,133	6,032	1,541	7,574	5,404	1,381	6,785
2013	5,756	1,465	7,220	6,188	1,575	7,763	5,420	1,379	6,800
2014	5,828	1,477	7,305	6,345	1,608	7,953	5,434	1,377	6,811
2015	5,902	1,490	7,392	6,506	1,642	8,148	5,448	1,375	6,823
2016	5,975	1,502	7,476	6,669	1,676	8,345	5,460	1,372	6,832
2017	6,047	1,513	7,560	6,835	1,711	8,545	5,471	1,369	6,841
2018	6,118	1,525	7,643	7,002	1,745	8,747	5,481	1,366	6,847
2019	6,188	1,535	7,723	7,171	1,779	8,951	5,488	1,362	6,850
2020	6,258	1,546	7,804	7,343	1,814	9,158	5,495	1,358	6,852
2021	6,327	1,557	7,884	7,518	1,850	9,368	5,500	1,353	6,853
2022	6,397	1,567	7,964	7,696	1,885	9,582	5,505	1,349	6,854
2023	6,466	1,577	8,044	7,878	1,922	9,799	5,510	1,344	6,854
2024	6,535	1,587	8,122	8,061	1,958	10,019	5,513	1,339	6,852
2025	6,603	1,597	8,199	8,248	1,995	10,242	5,515	1,334	6,848
2026	6,670	1,606	8,276	8,437	2,032	10,468	5,516	1,328	6,844
2027	6,738	1,616	8,354	8,629	2,069	10,699	5,516	1,323	6,839
2028	6,805	1,625	8,430	8,825	2,107	10,932	5,515	1,317	6,833
2029	6,871	1,634	8,505	9,023	2,146	11,168	5,514	1,311	6,825
2030	6,937	1,643	8,580	9,224	2,185	11,409	5,511	1,305	6,817

Year	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	1.44%	1.77%	1.51%	1.44%	1.77%	1.51%	1.44%	1.77%	1.51%
2009	1.48%	1.01%	1.38%	2.76%	2.28%	2.66%	0.47%	0.00%	0.38%
2010	1.72%	1.00%	1.57%	3.00%	2.27%	2.85%	0.71%	0.00%	0.56%
2011	1.33%	0.92%	1.24%	2.60%	2.19%	2.52%	0.32%	-0.08%	0.23%
2012	1.32%	0.91%	1.23%	2.59%	2.18%	2.51%	0.31%	-0.09%	0.23%
2013	1.31%	0.90%	1.23%	2.58%	2.17%	2.50%	0.30%	-0.10%	0.22%
2014	1.26%	0.84%	1.18%	2.54%	2.11%	2.45%	0.25%	-0.16%	0.17%
2015	1.26%	0.85%	1.18%	2.54%	2.11%	2.45%	0.26%	-0.16%	0.17%
2016	1.23%	0.81%	1.14%	2.50%	2.07%	2.42%	0.22%	-0.20%	0.14%
2017	1.21%	0.78%	1.13%	2.48%	2.05%	2.40%	0.20%	-0.22%	0.12%
2018	1.18%	0.75%	1.09%	2.45%	2.02%	2.37%	0.17%	-0.25%	0.09%
2019	1.14%	0.70%	1.05%	2.41%	1.97%	2.32%	0.13%	-0.30%	0.05%
2020	1.13%	0.69%	1.04%	2.40%	1.96%	2.31%	0.12%	-0.31%	0.04%
2021	1.11%	0.67%	1.02%	2.38%	1.94%	2.29%	0.10%	-0.33%	0.02%
2022	1.10%	0.67%	1.01%	2.37%	1.93%	2.28%	0.09%	-0.33%	0.01%
2023	1.09%	0.66%	1.00%	2.36%	1.92%	2.27%	0.08%	-0.34%	0.00%
2024	1.05%	0.62%	0.97%	2.33%	1.89%	2.24%	0.05%	-0.38%	-0.03%
2025	1.04%	0.61%	0.96%	2.31%	1.88%	2.23%	0.04%	-0.39%	-0.05%
2026	1.02%	0.59%	0.94%	2.29%	1.86%	2.21%	0.02%	-0.41%	-0.07%
2027	1.01%	0.59%	0.93%	2.28%	1.86%	2.20%	0.01%	-0.41%	-0.07%
2028	0.99%	0.57%	0.91%	2.26%	1.84%	2.18%	-0.01%	-0.43%	-0.09%
2029	0.97%	0.55%	0.89%	2.24%	1.81%	2.16%	-0.03%	-0.45%	-0.11%
2030	0.96%	0.55%	0.88%	2.23%	1.81%	2.15%	-0.04%	-0.45%	-0.12%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE 11**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	35,006,756	21,556	35,028,312	35,670,824	21,772	35,692,595	34,348,905	21,341	34,370,246
2009	35,263,600	21,757	35,285,357	36,384,815	22,207	36,407,023	34,256,435	21,283	34,277,719
2010	35,492,237	21,955	35,514,192	37,081,871	22,633	37,104,504	34,135,100	21,208	34,156,308
2011	35,768,213	22,175	35,790,389	37,840,602	23,096	37,863,698	34,058,021	21,160	34,079,181
2012	36,039,264	22,396	36,061,660	38,607,325	23,564	38,630,889	33,974,417	21,108	33,995,525
2013	36,312,784	22,618	36,335,401	39,390,003	24,042	39,414,044	33,891,429	21,056	33,912,486
2014	36,578,519	22,837	36,601,356	40,177,714	24,522	40,202,236	33,799,539	20,999	33,820,538
2015	36,847,607	23,057	36,870,664	40,982,714	25,014	41,007,728	33,709,207	20,943	33,730,150
2016	37,109,579	23,275	37,132,854	41,793,618	25,509	41,819,127	33,610,866	20,882	33,631,748
2017	37,377,161	23,494	37,400,654	42,624,753	26,016	42,650,769	33,516,235	20,823	33,537,058
2018	37,636,047	23,712	37,659,759	43,460,202	26,526	43,486,728	33,412,404	20,759	33,433,163
2019	37,887,114	23,928	37,911,042	44,300,795	27,039	44,327,834	33,300,441	20,689	33,321,130
2020	38,141,542	24,144	38,165,686	45,159,586	27,563	45,187,149	33,190,360	20,621	33,210,980
2021	38,395,705	24,360	38,420,065	46,032,635	28,096	46,060,731	33,078,958	20,552	33,099,509
2022	38,638,730	24,576	38,663,306	46,907,092	28,630	46,935,721	32,956,919	20,476	32,977,395
2023	38,880,537	24,792	38,905,329	47,794,779	29,171	47,823,951	32,832,998	20,399	32,853,397
2024	39,116,135	25,007	39,141,142	48,689,653	29,718	48,719,371	32,703,091	20,318	32,723,409
2025	39,348,658	25,222	39,373,880	49,595,625	30,271	49,625,895	32,569,960	20,235	32,590,196
2026	39,576,945	25,436	39,602,381	50,511,299	30,830	50,542,128	32,432,760	20,150	32,452,910
2027	39,804,693	25,650	39,830,343	51,441,461	31,397	51,472,858	32,294,631	20,064	32,314,696
2028	40,032,839	25,865	40,058,704	52,387,518	31,975	52,419,493	32,156,381	19,978	32,176,360
2029	40,255,295	26,078	40,281,374	53,341,721	32,557	53,374,278	32,013,150	19,889	32,033,039
2030	40,475,921	26,292	40,502,213	54,309,200	33,148	54,342,347	31,868,137	19,799	31,887,936

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	1.58%	8.78%	1.58%	2.48%	8.78%	2.49%	0.68%	8.78%	0.68%
2009	0.73%	0.93%	0.73%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2010	0.65%	0.91%	0.65%	1.92%	1.92%	1.92%	-0.35%	-0.35%	-0.35%
2011	0.78%	1.00%	0.78%	2.05%	2.05%	2.05%	-0.23%	-0.23%	-0.23%
2012	0.76%	1.00%	0.76%	2.03%	2.03%	2.03%	-0.25%	-0.25%	-0.25%
2013	0.76%	0.99%	0.76%	2.03%	2.03%	2.03%	-0.24%	-0.24%	-0.24%
2014	0.73%	0.97%	0.73%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2015	0.74%	0.96%	0.74%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2016	0.71%	0.95%	0.71%	1.98%	1.98%	1.98%	-0.29%	-0.29%	-0.29%
2017	0.72%	0.94%	0.72%	1.99%	1.99%	1.99%	-0.28%	-0.28%	-0.28%
2018	0.69%	0.93%	0.69%	1.96%	1.96%	1.96%	-0.31%	-0.31%	-0.31%
2019	0.67%	0.91%	0.67%	1.93%	1.93%	1.93%	-0.34%	-0.34%	-0.34%
2020	0.67%	0.90%	0.67%	1.94%	1.94%	1.94%	-0.33%	-0.33%	-0.33%
2021	0.67%	0.89%	0.67%	1.93%	1.93%	1.93%	-0.34%	-0.34%	-0.34%
2022	0.63%	0.89%	0.63%	1.90%	1.90%	1.90%	-0.37%	-0.37%	-0.37%
2023	0.63%	0.88%	0.63%	1.89%	1.89%	1.89%	-0.38%	-0.38%	-0.38%
2024	0.61%	0.87%	0.61%	1.87%	1.87%	1.87%	-0.40%	-0.40%	-0.40%
2025	0.59%	0.86%	0.59%	1.86%	1.86%	1.86%	-0.41%	-0.41%	-0.41%
2026	0.58%	0.85%	0.58%	1.85%	1.85%	1.85%	-0.42%	-0.42%	-0.42%
2027	0.58%	0.84%	0.58%	1.84%	1.84%	1.84%	-0.43%	-0.43%	-0.43%
2028	0.57%	0.84%	0.57%	1.84%	1.84%	1.84%	-0.43%	-0.43%	-0.43%
2029	0.56%	0.82%	0.56%	1.82%	1.82%	1.82%	-0.45%	-0.45%	-0.45%
2030	0.55%	0.82%	0.55%	1.81%	1.81%	1.81%	-0.45%	-0.45%	-0.45%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE 11**

Peak Day - Baseload									
Heating Season	Medium Forecast			High Forecast			Low Forecast		
	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms
		Peak-Day Therms	Peak-Day Therms		Peak-Day Therms	Peak-Day Therms		Peak-Day Therms	
2008	21,556	329,797	351,353	21,772	333,095	354,866	21,341	326,499	347,839
2009	21,757	333,080	354,837	22,207	339,762	361,969	21,283	325,620	346,903
2010	21,955	336,065	358,020	22,633	346,271	368,904	21,208	324,466	345,674
2011	22,175	339,034	361,209	23,096	353,356	376,452	21,160	323,734	344,893
2012	22,396	342,326	364,721	23,564	360,516	384,080	21,108	322,939	344,047
2013	22,618	345,624	368,242	24,042	367,824	391,866	21,056	322,150	343,206
2014	22,837	348,930	371,767	24,522	375,180	399,702	20,999	321,277	342,276
2015	23,057	352,201	375,257	25,014	382,697	407,711	20,943	320,418	341,361
2016	23,275	355,474	378,749	25,509	390,269	415,778	20,882	319,483	340,365
2017	23,494	358,738	382,231	26,016	398,030	424,046	20,823	318,584	339,407
2018	23,712	361,987	385,699	26,526	405,832	432,358	20,759	317,597	338,356
2019	23,928	365,228	389,156	27,039	413,681	440,720	20,689	316,533	337,222
2020	24,144	368,440	392,584	27,563	421,701	449,264	20,621	315,486	336,107
2021	24,360	371,651	396,011	28,096	429,853	457,949	20,552	314,427	334,979
2022	24,576	374,847	399,422	28,630	438,019	466,649	20,476	313,267	333,743
2023	24,792	378,036	402,829	29,171	446,308	475,480	20,399	312,089	332,488
2024	25,007	381,234	406,241	29,718	454,665	484,382	20,318	310,855	331,173
2025	25,222	384,399	409,621	30,271	463,125	493,395	20,235	309,589	329,824
2026	25,436	387,559	412,995	30,830	471,675	502,505	20,150	308,285	328,435
2027	25,650	390,713	416,363	31,397	480,361	511,758	20,064	306,972	327,036
2028	25,865	393,870	419,735	31,975	489,195	521,170	19,978	305,658	325,636
2029	26,078	397,024	423,103	32,557	498,106	530,663	19,889	304,296	324,186
2030	26,292	400,156	426,448	33,148	507,140	540,288	19,799	302,918	322,717

Annual Growth Rates									
Heating Season	Medium Forecast			High Forecast			Low Forecast		
	Daily Baseload Growth	Weather Sensitive Peak-Day Growth	Total Core Peak-Day Growth	Daily Baseload Growth	Weather Sensitive Peak-Day Growth	Total Core Peak-Day Growth	Daily Baseload Growth	Weather Sensitive Peak-Day Growth	Total Core Peak-Day Growth
		Therms Growth	Therms Growth		Therms Growth	Therms Growth		Therms Growth	
2008	8.78%	-6.30%	-5.49%	8.78%	-6.30%	-5.49%	8.78%	-6.30%	-5.49%
2009	0.93%	1.00%	0.99%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2010	0.91%	0.90%	0.90%	1.92%	1.92%	1.92%	-0.35%	-0.35%	-0.35%
2011	1.00%	0.88%	0.89%	2.05%	2.05%	2.05%	-0.23%	-0.23%	-0.23%
2012	1.00%	0.97%	0.97%	2.03%	2.03%	2.03%	-0.25%	-0.25%	-0.25%
2013	0.99%	0.96%	0.97%	2.03%	2.03%	2.03%	-0.24%	-0.24%	-0.24%
2014	0.97%	0.96%	0.96%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2015	0.96%	0.94%	0.94%	2.00%	2.00%	2.00%	-0.27%	-0.27%	-0.27%
2016	0.95%	0.93%	0.93%	1.98%	1.98%	1.98%	-0.29%	-0.29%	-0.29%
2017	0.94%	0.92%	0.92%	1.99%	1.99%	1.99%	-0.28%	-0.28%	-0.28%
2018	0.93%	0.91%	0.91%	1.96%	1.96%	1.96%	-0.31%	-0.31%	-0.31%
2019	0.91%	0.90%	0.90%	1.93%	1.93%	1.93%	-0.34%	-0.34%	-0.34%
2020	0.90%	0.88%	0.88%	1.94%	1.94%	1.94%	-0.33%	-0.33%	-0.33%
2021	0.89%	0.87%	0.87%	1.93%	1.93%	1.93%	-0.34%	-0.34%	-0.34%
2022	0.89%	0.86%	0.86%	1.90%	1.90%	1.90%	-0.37%	-0.37%	-0.37%
2023	0.88%	0.85%	0.85%	1.89%	1.89%	1.89%	-0.38%	-0.38%	-0.38%
2024	0.87%	0.85%	0.85%	1.87%	1.87%	1.87%	-0.40%	-0.40%	-0.40%
2025	0.86%	0.83%	0.83%	1.86%	1.86%	1.86%	-0.41%	-0.41%	-0.41%
2026	0.85%	0.82%	0.82%	1.85%	1.85%	1.85%	-0.42%	-0.42%	-0.42%
2027	0.84%	0.81%	0.82%	1.84%	1.84%	1.84%	-0.43%	-0.43%	-0.43%
2028	0.84%	0.81%	0.81%	1.84%	1.84%	1.84%	-0.43%	-0.43%	-0.43%
2029	0.82%	0.80%	0.80%	1.82%	1.82%	1.82%	-0.45%	-0.45%	-0.45%
2030	0.82%	0.79%	0.79%	1.81%	1.81%	1.81%	-0.45%	-0.45%	-0.45%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE 11**

Heating Season	Customer Forecast								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	14,135,088	20,893,223	35,028,312	14,419,204	21,273,391	35,692,595	13,853,800	20,516,446	34,370,246
2009	14,233,214	21,052,143	35,285,357	14,701,932	21,705,091	36,407,023	13,811,169	20,466,550	34,277,719
2010	14,328,326	21,185,866	35,514,192	14,986,340	22,118,164	37,104,504	13,765,119	20,391,189	34,156,308
2011	14,438,600	21,351,789	35,790,389	15,291,633	22,572,065	37,863,698	13,733,038	20,346,143	34,079,181
2012	14,548,444	21,513,216	36,061,660	15,601,775	23,029,115	38,630,889	13,699,829	20,295,696	33,995,525
2013	14,658,548	21,676,853	36,335,401	15,917,583	23,496,462	39,414,044	13,666,164	20,246,322	33,912,486
2014	14,766,775	21,834,581	36,601,356	16,236,802	23,965,434	40,202,236	13,630,079	20,190,458	33,820,538
2015	14,874,730	21,995,934	36,870,664	16,561,231	24,446,497	41,007,728	13,593,111	20,137,039	33,730,150
2016	14,981,816	22,151,038	37,132,854	16,890,272	24,928,854	41,819,127	13,554,743	20,077,005	33,631,748
2017	15,088,358	22,312,296	37,400,654	17,224,350	25,426,418	42,650,769	13,515,305	20,021,753	33,537,058
2018	15,194,779	22,464,980	37,659,759	17,564,021	25,922,707	43,486,728	13,475,204	19,957,959	33,433,163
2019	15,299,602	22,611,440	37,911,042	17,907,640	26,420,194	44,327,834	13,433,158	19,887,972	33,321,130
2020	15,403,935	22,761,751	38,165,686	18,256,545	26,930,604	45,187,149	13,390,190	19,820,791	33,210,980
2021	15,507,805	22,912,260	38,420,065	18,610,838	27,449,893	46,060,731	13,346,348	19,753,162	33,099,509
2022	15,611,060	23,052,246	38,663,306	18,970,408	27,965,313	46,935,721	13,301,529	19,675,866	32,977,395
2023	15,714,540	23,190,789	38,905,329	19,336,356	28,487,595	47,823,951	13,256,470	19,596,927	32,853,397
2024	15,816,607	23,324,534	39,141,142	19,706,749	29,012,622	48,719,371	13,209,811	19,513,598	32,723,409
2025	15,918,183	23,455,697	39,373,880	20,082,779	29,543,116	49,625,895	13,162,361	19,427,834	32,590,196
2026	16,019,192	23,583,189	39,602,381	20,464,428	30,077,700	50,542,128	13,114,085	19,338,825	32,452,910
2027	16,119,872	23,710,472	39,830,343	20,852,074	30,620,784	51,472,858	13,065,199	19,249,497	32,314,696
2028	16,220,491	23,838,213	40,058,704	21,246,156	31,173,337	52,419,493	13,015,939	19,160,421	32,176,360
2029	16,319,894	23,961,479	40,281,374	21,645,239	31,729,039	53,374,278	12,965,399	19,067,640	32,033,039
2030	16,418,939	24,083,275	40,502,213	22,050,519	32,291,829	54,342,347	12,914,294	18,973,642	31,887,936

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	0.69%	0.76%	0.73%	1.96%	2.03%	2.00%	-0.31%	-0.24%	-0.27%
2010	0.67%	0.64%	0.65%	1.93%	1.90%	1.92%	-0.33%	-0.37%	-0.35%
2011	0.77%	0.78%	0.78%	2.04%	2.05%	2.05%	-0.23%	-0.22%	-0.23%
2012	0.76%	0.76%	0.76%	2.03%	2.02%	2.03%	-0.24%	-0.25%	-0.25%
2013	0.76%	0.76%	0.76%	2.02%	2.03%	2.03%	-0.25%	-0.24%	-0.24%
2014	0.74%	0.73%	0.73%	2.01%	2.00%	2.00%	-0.26%	-0.28%	-0.27%
2015	0.73%	0.74%	0.74%	2.00%	2.01%	2.00%	-0.27%	-0.26%	-0.27%
2016	0.72%	0.71%	0.71%	1.99%	1.97%	1.98%	-0.28%	-0.30%	-0.29%
2017	0.71%	0.73%	0.72%	1.98%	2.00%	1.99%	-0.29%	-0.28%	-0.28%
2018	0.71%	0.68%	0.69%	1.97%	1.95%	1.96%	-0.30%	-0.32%	-0.31%
2019	0.69%	0.65%	0.67%	1.96%	1.92%	1.93%	-0.31%	-0.35%	-0.34%
2020	0.68%	0.66%	0.67%	1.95%	1.93%	1.94%	-0.32%	-0.34%	-0.33%
2021	0.67%	0.66%	0.67%	1.94%	1.93%	1.93%	-0.33%	-0.34%	-0.34%
2022	0.67%	0.61%	0.63%	1.93%	1.88%	1.90%	-0.34%	-0.39%	-0.37%
2023	0.66%	0.60%	0.63%	1.93%	1.87%	1.89%	-0.34%	-0.40%	-0.38%
2024	0.65%	0.58%	0.61%	1.92%	1.84%	1.87%	-0.35%	-0.43%	-0.40%
2025	0.64%	0.56%	0.59%	1.91%	1.83%	1.86%	-0.36%	-0.44%	-0.41%
2026	0.63%	0.54%	0.58%	1.90%	1.81%	1.85%	-0.37%	-0.46%	-0.42%
2027	0.63%	0.54%	0.58%	1.89%	1.81%	1.84%	-0.37%	-0.46%	-0.43%
2028	0.62%	0.54%	0.57%	1.89%	1.80%	1.84%	-0.38%	-0.46%	-0.43%
2029	0.61%	0.52%	0.56%	1.88%	1.78%	1.82%	-0.39%	-0.48%	-0.45%
2030	0.61%	0.51%	0.55%	1.87%	1.77%	1.81%	-0.39%	-0.49%	-0.45%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE 11

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	20,545	4,104	24,649	20,751	4,145	24,896	20,340	4,063	24,403
2009	20,731	4,148	24,879	21,202	4,242	25,444	20,320	4,066	24,385
2010	20,913	4,192	25,105	21,657	4,341	25,998	20,294	4,068	24,362
2011	21,118	4,239	25,357	22,145	4,445	26,589	20,289	4,072	24,362
2012	21,324	4,286	25,609	22,641	4,551	27,192	20,283	4,077	24,359
2013	21,530	4,333	25,863	23,148	4,659	27,806	20,275	4,081	24,356
2014	21,734	4,379	26,114	23,661	4,767	28,429	20,264	4,083	24,347
2015	21,939	4,426	26,365	24,185	4,879	29,064	20,251	4,085	24,337
2016	22,143	4,472	26,615	24,717	4,991	29,708	20,236	4,087	24,323
2017	22,347	4,517	26,865	25,259	5,106	30,364	20,220	4,087	24,307
2018	22,552	4,562	27,114	25,811	5,221	31,032	20,202	4,087	24,289
2019	22,755	4,606	27,361	26,371	5,338	31,708	20,181	4,085	24,266
2020	22,958	4,650	27,608	26,941	5,457	32,397	20,159	4,083	24,242
2021	23,162	4,694	27,855	27,521	5,577	33,098	20,135	4,080	24,215
2022	23,365	4,737	28,102	28,111	5,700	33,811	20,109	4,077	24,186
2023	23,569	4,781	28,350	28,714	5,824	34,538	20,083	4,074	24,157
2024	23,772	4,824	28,595	29,325	5,950	35,275	20,054	4,069	24,124
2025	23,974	4,866	28,841	29,947	6,079	36,026	20,024	4,064	24,088
2026	24,177	4,909	29,086	30,580	6,209	36,789	19,992	4,059	24,051
2027	24,380	4,951	29,331	31,225	6,341	37,566	19,960	4,053	24,013
2028	24,583	4,993	29,576	31,881	6,475	38,357	19,926	4,047	23,973
2029	24,786	5,035	29,820	32,548	6,611	39,159	19,890	4,040	23,930
2030	24,988	5,076	30,065	33,227	6,750	39,977	19,853	4,033	23,886

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	1.07%	0.81%	1.03%	1.07%	0.81%	1.03%	1.07%	0.81%	1.03%
2009	0.91%	1.08%	0.93%	2.17%	2.35%	2.20%	-0.10%	0.07%	-0.07%
2010	0.88%	1.05%	0.91%	2.15%	2.32%	2.18%	-0.12%	0.04%	-0.10%
2011	0.98%	1.12%	1.00%	2.25%	2.39%	2.27%	-0.02%	0.11%	0.00%
2012	0.97%	1.11%	1.00%	2.24%	2.39%	2.27%	-0.03%	0.11%	-0.01%
2013	0.97%	1.10%	0.99%	2.24%	2.38%	2.26%	-0.04%	0.10%	-0.01%
2014	0.95%	1.06%	0.97%	2.22%	2.34%	2.24%	-0.06%	0.06%	-0.04%
2015	0.94%	1.06%	0.96%	2.21%	2.34%	2.23%	-0.06%	0.06%	-0.04%
2016	0.93%	1.03%	0.95%	2.20%	2.31%	2.22%	-0.07%	0.03%	-0.06%
2017	0.92%	1.02%	0.94%	2.19%	2.29%	2.21%	-0.08%	0.01%	-0.07%
2018	0.92%	1.00%	0.93%	2.19%	2.27%	2.20%	-0.09%	-0.01%	-0.07%
2019	0.90%	0.96%	0.91%	2.17%	2.23%	2.18%	-0.10%	-0.04%	-0.09%
2020	0.89%	0.95%	0.90%	2.16%	2.22%	2.17%	-0.11%	-0.05%	-0.10%
2021	0.89%	0.94%	0.89%	2.15%	2.21%	2.16%	-0.12%	-0.07%	-0.11%
2022	0.88%	0.93%	0.89%	2.15%	2.20%	2.15%	-0.13%	-0.08%	-0.12%
2023	0.87%	0.92%	0.88%	2.14%	2.19%	2.15%	-0.13%	-0.08%	-0.12%
2024	0.86%	0.89%	0.87%	2.13%	2.16%	2.13%	-0.14%	-0.11%	-0.14%
2025	0.85%	0.89%	0.86%	2.12%	2.15%	2.13%	-0.15%	-0.12%	-0.15%
2026	0.85%	0.87%	0.85%	2.11%	2.14%	2.12%	-0.16%	-0.13%	-0.15%
2027	0.84%	0.86%	0.84%	2.11%	2.13%	2.11%	-0.16%	-0.14%	-0.16%
2028	0.83%	0.85%	0.84%	2.10%	2.12%	2.11%	-0.17%	-0.16%	-0.17%
2029	0.82%	0.83%	0.82%	2.09%	2.10%	2.09%	-0.18%	-0.17%	-0.18%
2030	0.82%	0.83%	0.82%	2.09%	2.09%	2.09%	-0.19%	-0.18%	-0.18%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE 20**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	30,277,288	24,593	30,301,881	30,857,638	24,839	30,882,477	29,702,435	24,347	29,726,782
2009	31,401,200	25,552	31,426,752	32,404,978	26,085	32,431,063	30,499,220	25,000	30,524,220
2010	32,524,924	26,513	32,551,437	33,986,479	27,358	34,013,836	31,276,737	25,638	31,302,374
2011	33,664,472	27,490	33,691,963	35,619,165	28,672	35,647,837	32,051,034	26,272	32,077,306
2012	34,779,616	28,452	34,808,068	37,261,601	29,994	37,291,595	32,783,650	26,873	32,810,523
2013	35,897,204	29,420	35,926,624	38,942,305	31,347	38,973,652	33,500,860	27,461	33,528,321
2014	37,011,378	30,388	37,041,767	40,655,600	32,726	40,688,326	34,197,443	28,032	34,225,475
2015	38,127,532	31,361	38,158,893	42,407,985	34,137	42,442,122	34,878,706	28,590	34,907,296
2016	39,228,892	32,323	39,261,215	44,181,437	35,564	44,217,001	35,529,567	29,124	35,558,691
2017	40,368,287	33,320	40,401,607	46,035,730	37,057	46,072,787	36,198,486	29,672	36,228,158
2018	41,480,865	34,299	41,515,164	47,898,927	38,557	47,937,484	36,826,611	30,187	36,856,798
2019	42,591,187	35,281	42,626,468	49,799,011	40,086	49,839,097	37,436,725	30,687	37,467,412
2020	43,733,212	36,237	43,769,449	51,776,418	41,678	51,818,096	38,058,873	31,197	38,090,070
2021	44,891,680	37,221	44,928,901	53,815,192	43,319	53,858,511	38,679,280	31,706	38,710,986
2022	45,979,504	38,125	46,017,629	55,811,979	44,926	55,856,905	39,222,798	32,151	39,254,949
2023	47,050,116	39,011	47,089,127	57,829,469	46,550	57,876,019	39,737,028	32,573	39,769,600
2024	48,131,673	39,915	48,171,589	59,902,305	48,219	59,950,524	40,246,445	32,990	40,279,435
2025	49,192,193	40,799	49,232,993	61,991,815	49,901	62,041,716	40,724,244	33,382	40,757,626
2026	50,237,174	41,668	50,278,842	64,104,689	51,602	64,156,290	41,175,742	33,752	41,209,493
2027	51,273,778	42,536	51,316,314	66,250,134	53,329	66,303,463	41,607,403	34,106	41,641,508
2028	52,353,931	43,459	52,397,390	68,495,848	55,136	68,550,985	42,061,752	34,478	42,096,230
2029	53,484,280	44,444	53,528,725	70,854,212	57,035	70,911,247	42,542,816	34,873	42,577,688
2030	54,534,989	45,341	54,580,330	73,154,326	58,886	73,213,212	42,947,334	35,204	42,982,539

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	1.25%	-7.62%	1.25%	2.17%	-7.62%	2.17%	0.34%	-7.62%	0.33%
2009	3.71%	3.90%	3.71%	5.01%	5.01%	5.01%	2.68%	2.68%	2.68%
2010	3.58%	3.76%	3.58%	4.88%	4.88%	4.88%	2.55%	2.55%	2.55%
2011	3.50%	3.69%	3.50%	4.80%	4.80%	4.80%	2.48%	2.48%	2.48%
2012	3.31%	3.50%	3.31%	4.61%	4.61%	4.61%	2.29%	2.29%	2.29%
2013	3.21%	3.40%	3.21%	4.51%	4.51%	4.51%	2.19%	2.19%	2.19%
2014	3.10%	3.29%	3.10%	4.40%	4.40%	4.40%	2.08%	2.08%	2.08%
2015	3.02%	3.20%	3.02%	4.31%	4.31%	4.31%	1.99%	1.99%	1.99%
2016	2.89%	3.07%	2.89%	4.18%	4.18%	4.18%	1.87%	1.87%	1.87%
2017	2.90%	3.08%	2.90%	4.20%	4.20%	4.20%	1.88%	1.88%	1.88%
2018	2.76%	2.94%	2.76%	4.05%	4.05%	4.05%	1.74%	1.74%	1.74%
2019	2.68%	2.86%	2.68%	3.97%	3.97%	3.97%	1.66%	1.66%	1.66%
2020	2.68%	2.71%	2.68%	3.97%	3.97%	3.97%	1.66%	1.66%	1.66%
2021	2.65%	2.72%	2.65%	3.94%	3.94%	3.94%	1.63%	1.63%	1.63%
2022	2.42%	2.43%	2.42%	3.71%	3.71%	3.71%	1.41%	1.41%	1.41%
2023	2.33%	2.32%	2.33%	3.61%	3.61%	3.61%	1.31%	1.31%	1.31%
2024	2.30%	2.32%	2.30%	3.58%	3.58%	3.58%	1.28%	1.28%	1.28%
2025	2.20%	2.21%	2.20%	3.49%	3.49%	3.49%	1.19%	1.19%	1.19%
2026	2.12%	2.13%	2.12%	3.41%	3.41%	3.41%	1.11%	1.11%	1.11%
2027	2.06%	2.08%	2.06%	3.35%	3.35%	3.35%	1.05%	1.05%	1.05%
2028	2.11%	2.17%	2.11%	3.39%	3.39%	3.39%	1.09%	1.09%	1.09%
2029	2.16%	2.27%	2.16%	3.44%	3.44%	3.44%	1.14%	1.14%	1.14%
2030	1.96%	2.02%	1.96%	3.25%	3.25%	3.25%	0.95%	0.95%	0.95%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE 20**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	24,593	369,498	394,091	24,839	373,193	398,032	24,347	365,803	390,150
2009	25,552	383,977	409,529	26,085	391,906	417,991	25,000	375,615	400,616
2010	26,513	398,128	424,641	27,358	411,033	438,390	25,638	385,191	410,829
2011	27,490	413,569	441,059	28,672	430,778	459,450	26,272	394,727	420,999
2012	28,452	428,499	456,952	29,994	450,642	480,636	26,873	403,750	430,622
2013	29,420	443,497	472,916	31,347	470,969	502,315	27,461	412,582	440,043
2014	30,388	458,530	488,918	32,726	491,689	524,415	28,032	421,161	449,193
2015	31,361	473,555	504,915	34,137	512,883	547,019	28,590	429,551	458,142
2016	32,323	488,450	520,773	35,564	534,331	569,895	29,124	437,567	466,691
2017	33,320	503,834	537,153	37,057	556,756	593,813	29,672	445,805	475,477
2018	34,299	518,949	553,248	38,557	579,290	617,847	30,187	453,541	483,728
2019	35,281	534,099	569,380	40,086	602,270	642,356	30,687	461,055	491,742
2020	36,237	548,986	585,223	41,678	626,184	667,862	31,197	468,717	499,914
2021	37,221	564,257	601,478	43,319	650,841	694,160	31,706	476,358	508,063
2022	38,125	578,385	616,510	44,926	674,991	719,917	32,151	483,051	515,202
2023	39,011	592,235	631,246	46,550	699,390	745,940	32,573	489,384	521,957
2024	39,915	606,373	646,289	48,219	724,459	772,678	32,990	495,658	528,648
2025	40,799	620,159	660,958	49,901	749,730	799,630	33,382	501,542	534,924
2026	41,668	633,743	675,411	51,602	775,283	826,884	33,752	507,103	540,855
2027	42,536	647,273	689,809	53,329	801,230	854,558	34,106	512,419	546,525
2028	43,459	661,585	705,044	55,136	828,389	883,526	34,478	518,015	552,493
2029	44,444	676,620	721,065	57,035	856,911	913,946	34,873	523,939	558,812
2030	45,341	690,676	736,017	58,886	884,729	943,615	35,204	528,921	564,125

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	-7.62%	8.11%	6.98%	-7.62%	8.11%	6.98%	-7.62%	8.11%	6.98%
2009	3.90%	3.92%	3.92%	5.01%	5.01%	5.01%	2.68%	2.68%	2.68%
2010	3.76%	3.69%	3.69%	4.88%	4.88%	4.88%	2.55%	2.55%	2.55%
2011	3.69%	3.88%	3.87%	4.80%	4.80%	4.80%	2.48%	2.48%	2.48%
2012	3.50%	3.61%	3.60%	4.61%	4.61%	4.61%	2.29%	2.29%	2.29%
2013	3.40%	3.50%	3.49%	4.51%	4.51%	4.51%	2.19%	2.19%	2.19%
2014	3.29%	3.39%	3.38%	4.40%	4.40%	4.40%	2.08%	2.08%	2.08%
2015	3.20%	3.28%	3.27%	4.31%	4.31%	4.31%	1.99%	1.99%	1.99%
2016	3.07%	3.15%	3.14%	4.18%	4.18%	4.18%	1.87%	1.87%	1.87%
2017	3.08%	3.15%	3.15%	4.20%	4.20%	4.20%	1.88%	1.88%	1.88%
2018	2.94%	3.00%	3.00%	4.05%	4.05%	4.05%	1.74%	1.74%	1.74%
2019	2.86%	2.92%	2.92%	3.97%	3.97%	3.97%	1.66%	1.66%	1.66%
2020	2.71%	2.79%	2.78%	3.97%	3.97%	3.97%	1.66%	1.66%	1.66%
2021	2.72%	2.78%	2.78%	3.94%	3.94%	3.94%	1.63%	1.63%	1.63%
2022	2.43%	2.50%	2.50%	3.71%	3.71%	3.71%	1.41%	1.41%	1.41%
2023	2.32%	2.39%	2.39%	3.61%	3.61%	3.61%	1.31%	1.31%	1.31%
2024	2.32%	2.39%	2.38%	3.58%	3.58%	3.58%	1.28%	1.28%	1.28%
2025	2.21%	2.27%	2.27%	3.49%	3.49%	3.49%	1.19%	1.19%	1.19%
2026	2.13%	2.19%	2.19%	3.41%	3.41%	3.41%	1.11%	1.11%	1.11%
2027	2.08%	2.13%	2.13%	3.35%	3.35%	3.35%	1.05%	1.05%	1.05%
2028	2.17%	2.21%	2.21%	3.39%	3.39%	3.39%	1.09%	1.09%	1.09%
2029	2.27%	2.27%	2.27%	3.44%	3.44%	3.44%	1.14%	1.14%	1.14%
2030	2.02%	2.08%	2.07%	3.25%	3.25%	3.25%	0.95%	0.95%	0.95%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE 20**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	11,659,561	18,642,321	30,301,881	11,893,918	18,988,559	30,882,477	11,427,536	18,299,247	29,726,782
2009	12,223,077	19,203,675	31,426,752	12,625,599	19,805,464	32,431,063	11,860,637	18,663,583	30,524,220
2010	12,820,138	19,731,299	32,551,437	13,408,889	20,604,947	34,013,836	12,316,213	18,986,161	31,302,374
2011	13,402,071	20,289,891	33,691,963	14,193,867	21,453,970	35,647,837	12,747,161	19,330,145	32,077,306
2012	13,981,784	20,826,285	34,808,068	14,994,088	22,297,507	37,291,595	13,166,223	19,644,301	32,810,523
2013	14,558,968	21,367,656	35,926,624	15,809,449	23,164,203	38,973,652	13,573,325	19,954,996	33,528,321
2014	15,132,153	21,909,613	37,041,767	16,638,553	24,049,772	40,688,326	13,967,332	20,258,143	34,225,475
2015	15,703,339	22,455,554	38,158,893	17,483,787	24,958,334	42,442,122	14,350,326	20,556,970	34,907,296
2016	16,270,973	22,990,242	39,261,215	18,343,649	25,873,352	44,217,001	14,721,104	20,837,588	35,558,691
2017	16,835,766	23,565,841	40,401,607	19,219,132	26,853,655	46,072,787	15,080,536	21,147,622	36,228,158
2018	17,397,352	24,117,812	41,515,164	20,110,030	27,827,454	47,937,484	15,428,514	21,428,284	36,856,798
2019	17,954,831	24,671,638	42,626,468	21,015,491	28,823,606	49,839,097	15,764,468	21,702,944	37,467,412
2020	18,510,174	25,259,275	43,769,449	21,938,019	29,880,077	51,818,096	16,090,352	21,999,718	38,090,070
2021	19,062,878	25,866,022	44,928,901	22,877,264	30,981,248	53,858,511	16,405,920	22,305,066	38,710,986
2022	19,612,759	26,404,871	46,017,629	23,833,233	32,023,672	55,856,905	16,711,208	22,543,741	39,254,949
2023	20,160,552	26,928,575	47,089,127	24,807,065	33,068,954	57,876,019	17,007,036	22,762,564	39,769,600
2024	20,704,574	27,467,015	48,171,589	25,796,925	34,153,599	59,950,524	17,292,173	22,987,262	40,279,435
2025	21,246,523	27,986,469	49,232,993	26,805,148	35,236,568	62,041,716	17,568,238	23,189,388	40,757,626
2026	21,785,621	28,493,221	50,278,842	27,831,009	36,325,281	64,156,290	17,834,763	23,374,731	41,209,493
2027	22,322,313	28,994,001	51,316,314	28,875,325	37,428,138	66,303,463	18,092,294	23,549,214	41,641,508
2028	22,856,231	29,541,159	52,397,390	29,937,876	38,613,108	68,550,985	18,340,709	23,755,521	42,096,230
2029	23,387,141	30,141,583	53,528,725	31,018,600	39,892,647	70,911,247	18,579,999	23,997,689	42,577,688
2030	23,915,866	30,664,464	54,580,330	32,118,840	41,094,372	73,213,212	18,810,993	24,171,546	42,982,539

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	4.83%	3.01%	3.71%	6.15%	4.30%	5.01%	3.79%	1.99%	2.68%
2010	4.88%	2.75%	3.58%	6.20%	4.04%	4.88%	3.84%	1.73%	2.55%
2011	4.54%	2.83%	3.50%	5.85%	4.12%	4.80%	3.50%	1.81%	2.48%
2012	4.33%	2.64%	3.31%	5.64%	3.93%	4.61%	3.29%	1.63%	2.29%
2013	4.13%	2.60%	3.21%	5.44%	3.89%	4.51%	3.09%	1.58%	2.19%
2014	3.94%	2.54%	3.10%	5.24%	3.82%	4.40%	2.90%	1.52%	2.08%
2015	3.77%	2.49%	3.02%	5.08%	3.78%	4.31%	2.74%	1.48%	1.99%
2016	3.61%	2.38%	2.89%	4.92%	3.67%	4.18%	2.58%	1.37%	1.87%
2017	3.47%	2.50%	2.90%	4.77%	3.79%	4.20%	2.44%	1.49%	1.88%
2018	3.34%	2.34%	2.76%	4.64%	3.63%	4.05%	2.31%	1.33%	1.74%
2019	3.20%	2.30%	2.68%	4.50%	3.58%	3.97%	2.18%	1.28%	1.66%
2020	3.09%	2.38%	2.68%	4.39%	3.67%	3.97%	2.07%	1.37%	1.66%
2021	2.99%	2.40%	2.65%	4.28%	3.69%	3.94%	1.96%	1.39%	1.63%
2022	2.88%	2.08%	2.42%	4.18%	3.36%	3.71%	1.86%	1.07%	1.41%
2023	2.79%	1.98%	2.33%	4.09%	3.26%	3.61%	1.77%	0.97%	1.31%
2024	2.70%	2.00%	2.30%	3.99%	3.28%	3.58%	1.68%	0.99%	1.28%
2025	2.62%	1.89%	2.20%	3.91%	3.17%	3.49%	1.60%	0.88%	1.19%
2026	2.54%	1.81%	2.12%	3.83%	3.09%	3.41%	1.52%	0.80%	1.11%
2027	2.46%	1.76%	2.06%	3.75%	3.04%	3.35%	1.44%	0.75%	1.05%
2028	2.39%	1.89%	2.11%	3.68%	3.17%	3.39%	1.37%	0.88%	1.09%
2029	2.32%	2.03%	2.16%	3.61%	3.31%	3.44%	1.30%	1.02%	1.14%
2030	2.26%	1.73%	1.96%	3.55%	3.01%	3.25%	1.24%	0.72%	0.95%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE 20

Customer Forecast									
Year	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	20,348	3,546	23,895	20,552	3,582	24,134	20,145	3,511	23,656
2009	21,376	3,640	25,017	21,862	3,723	25,585	20,952	3,568	24,520
2010	22,467	3,734	26,201	23,266	3,866	27,133	21,802	3,623	25,425
2011	23,536	3,830	27,366	24,680	4,016	28,696	22,612	3,680	26,292
2012	24,606	3,927	28,532	26,126	4,169	30,295	23,405	3,735	27,140
2013	25,675	4,023	29,699	27,604	4,326	31,930	24,179	3,789	27,968
2014	26,742	4,120	30,861	29,113	4,485	33,598	24,932	3,841	28,773
2015	27,809	4,216	32,025	30,656	4,648	35,303	25,670	3,892	29,562
2016	28,875	4,312	33,187	32,230	4,813	37,044	26,388	3,941	30,329
2017	29,939	4,408	34,348	33,839	4,983	38,822	27,089	3,989	31,077
2018	31,003	4,504	35,507	35,482	5,155	40,637	27,772	4,035	31,807
2019	32,063	4,599	36,662	37,157	5,330	42,487	28,436	4,079	32,515
2020	33,124	4,695	37,818	38,869	5,509	44,378	29,084	4,122	33,207
2021	34,184	4,790	38,974	40,618	5,692	46,310	29,717	4,164	33,881
2022	35,244	4,885	40,129	42,404	5,878	48,282	30,333	4,205	34,538
2023	36,304	4,981	41,285	44,229	6,068	50,297	30,935	4,244	35,179
2024	37,361	5,076	42,437	46,090	6,261	52,351	31,519	4,282	35,801
2025	38,420	5,171	43,590	47,991	6,459	54,450	32,089	4,319	36,408
2026	39,477	5,266	44,742	49,932	6,660	56,592	32,644	4,354	36,998
2027	40,534	5,361	45,895	51,914	6,866	58,780	33,185	4,389	37,573
2028	41,590	5,456	47,046	53,937	7,075	61,012	33,711	4,422	38,133
2029	42,645	5,564	48,209	56,001	7,306	63,307	34,222	4,465	38,687
2030	43,700	5,659	49,359	58,108	7,524	65,633	34,720	4,496	39,215

Annual Growth Rates									
Year	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	5.12%	2.85%	4.77%	5.12%	2.85%	4.77%	5.12%	2.85%	4.77%
2009	5.05%	2.65%	4.70%	6.37%	3.94%	6.01%	4.01%	1.63%	3.65%
2010	5.10%	2.56%	4.73%	6.43%	3.85%	6.05%	4.06%	1.54%	3.69%
2011	4.76%	2.59%	4.45%	6.08%	3.88%	5.76%	3.72%	1.56%	3.41%
2012	4.54%	2.52%	4.26%	5.86%	3.81%	5.57%	3.50%	1.50%	3.22%
2013	4.35%	2.46%	4.09%	5.66%	3.75%	5.40%	3.31%	1.44%	3.05%
2014	4.15%	2.39%	3.92%	5.46%	3.68%	5.22%	3.12%	1.37%	2.88%
2015	3.99%	2.34%	3.77%	5.30%	3.63%	5.08%	2.96%	1.32%	2.74%
2016	3.83%	2.28%	3.63%	5.14%	3.57%	4.93%	2.80%	1.26%	2.60%
2017	3.69%	2.23%	3.50%	4.99%	3.51%	4.80%	2.66%	1.21%	2.47%
2018	3.55%	2.17%	3.37%	4.85%	3.46%	4.68%	2.52%	1.16%	2.35%
2019	3.42%	2.11%	3.25%	4.72%	3.40%	4.55%	2.39%	1.10%	2.23%
2020	3.31%	2.07%	3.15%	4.61%	3.36%	4.45%	2.28%	1.06%	2.13%
2021	3.20%	2.03%	3.06%	4.50%	3.31%	4.35%	2.17%	1.02%	2.03%
2022	3.10%	1.99%	2.96%	4.40%	3.27%	4.26%	2.07%	0.97%	1.94%
2023	3.01%	1.95%	2.88%	4.30%	3.24%	4.17%	1.98%	0.94%	1.86%
2024	2.91%	1.91%	2.79%	4.21%	3.19%	4.08%	1.89%	0.89%	1.77%
2025	2.83%	1.87%	2.72%	4.13%	3.15%	4.01%	1.81%	0.86%	1.70%
2026	2.75%	1.84%	2.64%	4.04%	3.12%	3.93%	1.73%	0.82%	1.62%
2027	2.68%	1.80%	2.57%	3.97%	3.09%	3.87%	1.66%	0.79%	1.55%
2028	2.61%	1.77%	2.51%	3.90%	3.05%	3.80%	1.58%	0.76%	1.49%
2029	2.54%	1.98%	2.47%	3.83%	3.26%	3.76%	1.52%	0.97%	1.45%
2030	2.47%	1.71%	2.39%	3.76%	2.99%	3.67%	1.45%	0.70%	1.37%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE 24**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	9,474,308	7,364	9,481,673	9,660,877	7,438	9,668,315	9,289,557	7,291	9,296,848
2009	9,514,346	7,443	9,521,789	9,824,123	7,564	9,831,687	9,235,714	7,248	9,242,962
2010	9,587,434	7,517	9,594,951	10,024,070	7,718	10,031,788	9,214,131	7,232	9,221,362
2011	9,674,013	7,594	9,681,607	10,241,971	7,885	10,249,857	9,204,705	7,224	9,211,929
2012	9,761,329	7,671	9,769,000	10,464,584	8,057	10,472,641	9,195,226	7,217	9,202,442
2013	9,847,200	7,748	9,854,948	10,689,607	8,230	10,697,837	9,183,679	7,208	9,190,887
2014	9,935,058	7,824	9,942,881	10,920,815	8,408	10,929,223	9,173,283	7,199	9,180,482
2015	10,025,700	7,901	10,033,601	11,159,252	8,592	11,167,844	9,164,726	7,193	9,171,919
2016	10,116,949	7,977	10,124,926	11,402,649	8,779	11,411,428	9,155,972	7,186	9,163,158
2017	10,210,027	8,053	10,218,080	11,652,470	8,971	11,661,441	9,148,139	7,180	9,155,319
2018	10,305,037	8,129	10,313,165	11,909,018	9,169	11,918,187	9,141,253	7,174	9,148,428
2019	10,404,877	8,204	10,413,081	12,175,827	9,374	12,185,201	9,137,837	7,172	9,145,008
2020	10,506,795	8,280	10,515,075	12,449,910	9,585	12,459,496	9,135,399	7,170	9,142,568
2021	10,613,310	8,356	10,621,666	12,734,472	9,804	12,744,276	9,136,061	7,170	9,143,231
2022	10,721,463	8,434	10,729,896	13,026,246	10,029	13,036,275	9,137,176	7,171	9,144,347
2023	10,833,059	8,512	10,841,571	13,327,588	10,261	13,337,849	9,140,263	7,174	9,147,436
2024	10,950,814	8,590	10,959,404	13,642,108	10,503	13,652,611	9,147,529	7,179	9,154,709
2025	11,072,486	8,669	11,081,155	13,967,377	10,754	13,978,130	9,156,980	7,187	9,164,167
2026	11,201,118	8,750	11,209,867	14,307,557	11,016	14,318,572	9,171,030	7,198	9,178,227
2027	11,351,653	8,857	11,360,510	14,682,430	11,304	14,693,734	9,201,654	7,222	9,208,876
2028	11,495,324	8,940	11,504,265	15,055,436	11,591	15,067,027	9,225,252	7,240	9,232,493
2029	11,646,373	9,025	11,655,398	15,445,277	11,891	15,457,169	9,253,329	7,262	9,260,592
2030	11,806,248	9,111	11,815,360	15,854,393	12,206	15,866,600	9,286,870	7,289	9,294,159

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	4.78%	13.21%	4.78%	5.78%	13.21%	5.79%	3.77%	13.21%	3.78%
2009	0.42%	1.07%	0.42%	1.69%	1.69%	1.69%	-0.58%	-0.58%	-0.58%
2010	0.77%	1.00%	0.77%	2.04%	2.04%	2.04%	-0.23%	-0.23%	-0.23%
2011	0.90%	1.02%	0.90%	2.17%	2.17%	2.17%	-0.10%	-0.10%	-0.10%
2012	0.90%	1.02%	0.90%	2.17%	2.17%	2.17%	-0.10%	-0.10%	-0.10%
2013	0.88%	0.99%	0.88%	2.15%	2.15%	2.15%	-0.13%	-0.13%	-0.13%
2014	0.89%	0.98%	0.89%	2.16%	2.16%	2.16%	-0.11%	-0.11%	-0.11%
2015	0.91%	0.99%	0.91%	2.18%	2.18%	2.18%	-0.09%	-0.09%	-0.09%
2016	0.91%	0.96%	0.91%	2.18%	2.18%	2.18%	-0.10%	-0.10%	-0.10%
2017	0.92%	0.95%	0.92%	2.19%	2.19%	2.19%	-0.09%	-0.09%	-0.09%
2018	0.93%	0.94%	0.93%	2.20%	2.20%	2.20%	-0.08%	-0.08%	-0.08%
2019	0.97%	0.93%	0.97%	2.24%	2.24%	2.24%	-0.04%	-0.04%	-0.04%
2020	0.98%	0.92%	0.98%	2.25%	2.25%	2.25%	-0.03%	-0.03%	-0.03%
2021	1.01%	0.92%	1.01%	2.29%	2.29%	2.29%	0.01%	0.01%	0.01%
2022	1.02%	0.93%	1.02%	2.29%	2.29%	2.29%	0.01%	0.01%	0.01%
2023	1.04%	0.93%	1.04%	2.31%	2.31%	2.31%	0.03%	0.03%	0.03%
2024	1.09%	0.92%	1.09%	2.36%	2.36%	2.36%	0.08%	0.08%	0.08%
2025	1.11%	0.92%	1.11%	2.38%	2.38%	2.38%	0.10%	0.10%	0.10%
2026	1.16%	0.93%	1.16%	2.44%	2.44%	2.44%	0.15%	0.15%	0.15%
2027	1.34%	1.22%	1.34%	2.62%	2.62%	2.62%	0.33%	0.33%	0.33%
2028	1.27%	0.95%	1.27%	2.54%	2.54%	2.54%	0.26%	0.26%	0.26%
2029	1.31%	0.94%	1.31%	2.59%	2.59%	2.59%	0.30%	0.30%	0.30%
2030	1.37%	0.96%	1.37%	2.65%	2.65%	2.65%	0.36%	0.36%	0.36%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE 24**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	7,364	55,297	62,661	7,438	55,850	63,288	7,291	54,744	62,035
2009	7,443	56,768	64,211	7,564	56,794	64,357	7,248	54,427	61,675
2010	7,517	57,457	64,975	7,718	57,950	65,667	7,232	54,300	61,531
2011	7,594	58,058	65,652	7,885	59,209	67,095	7,224	54,244	61,468
2012	7,671	58,677	66,349	8,057	60,496	68,553	7,217	54,188	61,405
2013	7,748	59,318	67,065	8,230	61,797	70,027	7,208	54,120	61,328
2014	7,824	59,935	67,759	8,408	63,134	71,542	7,199	54,059	61,258
2015	7,901	60,541	68,442	8,592	64,512	73,104	7,193	54,008	61,201
2016	7,977	61,161	69,138	8,779	65,919	74,698	7,186	53,957	61,143
2017	8,053	61,765	69,818	8,971	67,363	76,335	7,180	53,911	61,090
2018	8,129	62,357	70,486	9,169	68,847	78,015	7,174	53,870	61,044
2019	8,204	62,938	71,142	9,374	70,389	79,763	7,172	53,850	61,022
2020	8,280	63,511	71,790	9,585	71,974	81,559	7,170	53,836	61,005
2021	8,356	64,067	72,423	9,804	73,619	83,423	7,170	53,839	61,010
2022	8,434	64,631	73,065	10,029	75,305	85,334	7,171	53,846	61,017
2023	8,512	65,197	73,710	10,261	77,047	87,308	7,174	53,864	61,038
2024	8,590	65,757	74,347	10,503	78,866	89,369	7,179	53,907	61,086
2025	8,669	66,300	74,970	10,754	80,746	91,500	7,187	53,963	61,149
2026	8,750	66,835	75,585	11,016	82,713	93,728	7,198	54,046	61,243
2027	8,857	67,302	76,159	11,304	84,880	96,184	7,222	54,226	61,448
2028	8,940	68,135	77,076	11,591	87,036	98,628	7,240	54,365	61,605
2029	9,025	68,663	77,688	11,891	89,290	101,181	7,262	54,531	61,793
2030	9,111	69,169	78,280	12,206	91,655	103,861	7,289	54,728	62,017

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	13.21%	10.18%	10.52%	13.21%	10.18%	10.52%	13.21%	10.18%	10.52%
2009	1.07%	2.66%	2.47%	1.69%	1.69%	1.69%	-0.58%	-0.58%	-0.58%
2010	1.00%	1.21%	1.19%	2.04%	2.04%	2.04%	-0.23%	-0.23%	-0.23%
2011	1.02%	1.05%	1.04%	2.17%	2.17%	2.17%	-0.10%	-0.10%	-0.10%
2012	1.02%	1.07%	1.06%	2.17%	2.17%	2.17%	-0.10%	-0.10%	-0.10%
2013	0.99%	1.09%	1.08%	2.15%	2.15%	2.15%	-0.13%	-0.13%	-0.13%
2014	0.98%	1.04%	1.03%	2.16%	2.16%	2.16%	-0.11%	-0.11%	-0.11%
2015	0.99%	1.01%	1.01%	2.18%	2.18%	2.18%	-0.09%	-0.09%	-0.09%
2016	0.96%	1.02%	1.02%	2.18%	2.18%	2.18%	-0.10%	-0.10%	-0.10%
2017	0.95%	0.99%	0.98%	2.19%	2.19%	2.19%	-0.09%	-0.09%	-0.09%
2018	0.94%	0.96%	0.96%	2.20%	2.20%	2.20%	-0.08%	-0.08%	-0.08%
2019	0.93%	0.93%	0.93%	2.24%	2.24%	2.24%	-0.04%	-0.04%	-0.04%
2020	0.92%	0.91%	0.91%	2.25%	2.25%	2.25%	-0.03%	-0.03%	-0.03%
2021	0.92%	0.88%	0.88%	2.29%	2.29%	2.29%	0.01%	0.01%	0.01%
2022	0.93%	0.88%	0.89%	2.29%	2.29%	2.29%	0.01%	0.01%	0.01%
2023	0.93%	0.88%	0.88%	2.31%	2.31%	2.31%	0.03%	0.03%	0.03%
2024	0.92%	0.86%	0.86%	2.36%	2.36%	2.36%	0.08%	0.08%	0.08%
2025	0.92%	0.83%	0.84%	2.38%	2.38%	2.38%	0.10%	0.10%	0.10%
2026	0.93%	0.81%	0.82%	2.44%	2.44%	2.44%	0.15%	0.15%	0.15%
2027	1.22%	0.70%	0.76%	2.62%	2.62%	2.62%	0.33%	0.33%	0.33%
2028	0.95%	1.24%	1.20%	2.54%	2.54%	2.54%	0.26%	0.26%	0.26%
2029	0.94%	0.77%	0.79%	2.59%	2.59%	2.59%	0.30%	0.30%	0.30%
2030	0.96%	0.74%	0.76%	2.65%	2.65%	2.65%	0.36%	0.36%	0.36%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE 24**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	4,414,864	5,066,809	9,481,673	4,503,603	5,164,713	9,668,315	4,327,008	4,969,840	9,296,848
2009	4,449,638	5,072,152	9,521,789	4,596,170	5,235,517	9,831,687	4,317,696	4,925,266	9,242,962
2010	4,482,519	5,112,433	9,594,951	4,688,374	5,343,414	10,031,788	4,306,323	4,915,039	9,221,362
2011	4,509,928	5,171,679	9,681,607	4,776,375	5,473,482	10,249,857	4,289,544	4,922,385	9,211,929
2012	4,537,470	5,231,530	9,769,000	4,865,990	5,606,651	10,472,641	4,272,798	4,929,644	9,202,442
2013	4,564,054	5,290,894	9,854,948	4,956,064	5,741,773	10,697,837	4,255,067	4,935,819	9,190,887
2014	4,589,868	5,353,014	9,942,881	5,046,787	5,882,436	10,929,223	4,236,555	4,943,927	9,180,482
2015	4,615,795	5,417,806	10,033,601	5,139,134	6,028,709	11,167,844	4,218,094	4,953,825	9,171,919
2016	4,640,496	5,484,430	10,124,926	5,231,625	6,179,803	11,411,428	4,198,472	4,964,687	9,163,158
2017	4,664,627	5,553,453	10,218,080	5,324,977	6,336,464	11,661,441	4,178,311	4,977,008	9,155,319
2018	4,687,964	5,625,202	10,313,165	5,418,933	6,499,254	11,918,187	4,157,432	4,990,996	9,148,428
2019	4,709,963	5,703,118	10,413,081	5,512,844	6,672,356	12,185,201	4,135,381	5,009,628	9,145,008
2020	4,731,388	5,783,687	10,515,075	5,607,580	6,851,916	12,459,496	4,112,857	5,029,711	9,142,568
2021	4,752,621	5,869,045	10,621,666	5,703,597	7,040,680	12,744,276	4,090,207	5,053,024	9,143,231
2022	4,773,489	5,956,407	10,729,896	5,800,698	7,235,577	13,036,275	4,067,290	5,077,058	9,144,347
2023	4,793,941	6,047,630	10,841,571	5,898,827	7,439,022	13,337,849	4,044,072	5,103,364	9,147,436
2024	4,812,805	6,146,599	10,959,404	5,996,528	7,656,083	13,652,611	4,019,588	5,135,121	9,154,709
2025	4,831,348	6,249,808	11,081,155	6,095,350	7,882,781	13,978,130	3,994,925	5,169,242	9,164,167
2026	4,849,389	6,360,478	11,209,867	6,195,067	8,123,505	14,318,572	3,969,944	5,208,283	9,178,227
2027	4,882,644	6,477,865	11,360,510	6,316,010	8,377,725	14,693,734	3,957,396	5,251,480	9,208,876
2028	4,899,892	6,604,373	11,504,265	6,418,047	8,648,981	15,067,027	3,931,859	5,300,633	9,232,493
2029	4,915,767	6,739,631	11,655,398	6,519,832	8,937,337	15,457,169	3,905,349	5,355,242	9,260,592
2030	4,931,456	6,883,904	11,815,360	6,622,910	9,243,689	15,866,600	3,878,830	5,415,329	9,294,159

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	0.79%	0.11%	0.42%	2.06%	1.37%	1.69%	-0.22%	-0.90%	-0.58%
2010	0.74%	0.79%	0.77%	2.01%	2.06%	2.04%	-0.26%	-0.21%	-0.23%
2011	0.61%	1.16%	0.90%	1.88%	2.43%	2.17%	-0.39%	0.15%	-0.10%
2012	0.61%	1.16%	0.90%	1.88%	2.43%	2.17%	-0.39%	0.15%	-0.10%
2013	0.59%	1.13%	0.88%	1.85%	2.41%	2.15%	-0.41%	0.13%	-0.13%
2014	0.57%	1.17%	0.89%	1.83%	2.45%	2.16%	-0.44%	0.16%	-0.11%
2015	0.56%	1.21%	0.91%	1.83%	2.49%	2.18%	-0.44%	0.20%	-0.09%
2016	0.54%	1.23%	0.91%	1.80%	2.51%	2.18%	-0.47%	0.22%	-0.10%
2017	0.52%	1.26%	0.92%	1.78%	2.54%	2.19%	-0.48%	0.25%	-0.09%
2018	0.50%	1.29%	0.93%	1.76%	2.57%	2.20%	-0.50%	0.28%	-0.08%
2019	0.47%	1.39%	0.97%	1.73%	2.66%	2.24%	-0.53%	0.37%	-0.04%
2020	0.45%	1.41%	0.98%	1.72%	2.69%	2.25%	-0.54%	0.40%	-0.03%
2021	0.45%	1.48%	1.01%	1.71%	2.75%	2.29%	-0.55%	0.46%	0.01%
2022	0.44%	1.49%	1.02%	1.70%	2.77%	2.29%	-0.56%	0.48%	0.01%
2023	0.43%	1.53%	1.04%	1.69%	2.81%	2.31%	-0.57%	0.52%	0.03%
2024	0.39%	1.64%	1.09%	1.66%	2.92%	2.36%	-0.61%	0.62%	0.08%
2025	0.39%	1.68%	1.11%	1.65%	2.96%	2.38%	-0.61%	0.66%	0.10%
2026	0.37%	1.77%	1.16%	1.64%	3.05%	2.44%	-0.63%	0.76%	0.15%
2027	0.69%	1.85%	1.34%	1.95%	3.13%	2.62%	-0.32%	0.83%	0.33%
2028	0.35%	1.95%	1.27%	1.62%	3.24%	2.54%	-0.65%	0.94%	0.26%
2029	0.32%	2.05%	1.31%	1.59%	3.33%	2.59%	-0.67%	1.03%	0.30%
2030	0.32%	2.14%	1.37%	1.58%	3.43%	2.65%	-0.68%	1.12%	0.36%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE 24

Year	Customer Forecast								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	6,986	1,444	8,430	7,055	1,458	8,514	6,916	1,430	8,345
2009	7,062	1,458	8,519	7,222	1,491	8,713	6,921	1,429	8,350
2010	7,135	1,470	8,605	7,388	1,522	8,911	6,923	1,427	8,350
2011	7,198	1,494	8,692	7,548	1,567	9,115	6,916	1,435	8,351
2012	7,262	1,519	8,781	7,711	1,613	9,323	6,908	1,445	8,352
2013	7,325	1,543	8,868	7,875	1,659	9,534	6,898	1,453	8,351
2014	7,386	1,569	8,955	8,041	1,708	9,749	6,886	1,463	8,349
2015	7,448	1,596	9,043	8,210	1,759	9,969	6,875	1,473	8,348
2016	7,508	1,623	9,131	8,380	1,812	10,192	6,861	1,483	8,344
2017	7,567	1,651	9,217	8,552	1,866	10,418	6,846	1,493	8,340
2018	7,624	1,680	9,304	8,726	1,922	10,648	6,830	1,505	8,335
2019	7,680	1,711	9,391	8,900	1,983	10,883	6,811	1,517	8,328
2020	7,735	1,742	9,477	9,076	2,045	11,121	6,791	1,530	8,321
2021	7,789	1,776	9,565	9,255	2,110	11,365	6,771	1,543	8,315
2022	7,843	1,810	9,654	9,437	2,178	11,615	6,750	1,558	8,308
2023	7,897	1,846	9,743	9,621	2,250	11,870	6,729	1,573	8,302
2024	7,948	1,885	9,833	9,804	2,325	12,130	6,705	1,590	8,295
2025	7,998	1,925	9,923	9,990	2,405	12,395	6,680	1,608	8,288
2026	8,047	1,968	10,015	10,179	2,489	12,668	6,655	1,627	8,282
2027	8,125	2,013	10,138	10,406	2,578	12,984	6,652	1,648	8,300
2028	8,173	2,060	10,234	10,600	2,672	13,272	6,625	1,670	8,295
2029	8,220	2,110	10,330	10,794	2,771	13,565	6,596	1,694	8,290
2030	8,266	2,164	10,429	10,991	2,877	13,868	6,567	1,719	8,286

Year	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	0.98%	6.41%	1.87%	0.98%	6.41%	1.87%	0.98%	6.41%	1.87%
2009	1.09%	0.96%	1.07%	2.36%	2.23%	2.34%	0.08%	-0.05%	0.06%
2010	1.03%	0.85%	1.00%	2.30%	2.12%	2.27%	0.03%	-0.15%	0.00%
2011	0.89%	1.62%	1.02%	2.16%	2.90%	2.29%	-0.11%	0.61%	0.01%
2012	0.89%	1.66%	1.02%	2.16%	2.94%	2.29%	-0.11%	0.65%	0.02%
2013	0.86%	1.62%	0.99%	2.13%	2.90%	2.26%	-0.14%	0.61%	-0.01%
2014	0.84%	1.66%	0.98%	2.11%	2.93%	2.25%	-0.17%	0.64%	-0.02%
2015	0.84%	1.69%	0.99%	2.10%	2.97%	2.26%	-0.17%	0.68%	-0.02%
2016	0.80%	1.72%	0.96%	2.07%	3.00%	2.23%	-0.20%	0.71%	-0.04%
2017	0.79%	1.71%	0.95%	2.05%	2.99%	2.22%	-0.22%	0.69%	-0.06%
2018	0.76%	1.76%	0.94%	2.03%	3.04%	2.21%	-0.24%	0.75%	-0.06%
2019	0.73%	1.85%	0.93%	2.00%	3.13%	2.20%	-0.27%	0.84%	-0.07%
2020	0.71%	1.85%	0.92%	1.98%	3.13%	2.19%	-0.29%	0.84%	-0.08%
2021	0.70%	1.90%	0.92%	1.97%	3.18%	2.19%	-0.30%	0.89%	-0.08%
2022	0.69%	1.96%	0.93%	1.96%	3.24%	2.20%	-0.31%	0.94%	-0.08%
2023	0.68%	2.00%	0.93%	1.95%	3.28%	2.20%	-0.32%	0.99%	-0.08%
2024	0.64%	2.09%	0.92%	1.91%	3.37%	2.19%	-0.36%	1.07%	-0.09%
2025	0.63%	2.13%	0.92%	1.90%	3.41%	2.19%	-0.37%	1.11%	-0.08%
2026	0.62%	2.22%	0.93%	1.89%	3.50%	2.20%	-0.38%	1.20%	-0.07%
2027	0.96%	2.28%	1.22%	2.23%	3.57%	2.50%	-0.04%	1.26%	0.21%
2028	0.60%	2.36%	0.95%	1.86%	3.64%	2.22%	-0.40%	1.34%	-0.06%
2029	0.56%	2.44%	0.94%	1.83%	3.73%	2.21%	-0.44%	1.42%	-0.06%
2030	0.56%	2.53%	0.96%	1.82%	3.82%	2.23%	-0.44%	1.51%	-0.04%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE 26**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	7,409,740	7,722	7,417,462	7,548,911	7,799	7,556,710	7,271,857	7,645	7,279,502
2009	7,504,822	7,837	7,512,659	7,742,051	7,999	7,750,050	7,291,821	7,666	7,299,487
2010	7,592,910	7,942	7,600,853	7,931,562	8,194	7,939,757	7,303,923	7,678	7,311,602
2011	7,713,882	8,070	7,721,952	8,159,275	8,430	8,167,704	7,346,470	7,723	7,354,193
2012	7,832,137	8,193	7,840,330	8,388,544	8,667	8,397,211	7,384,888	7,764	7,392,652
2013	7,950,682	8,316	7,958,998	8,622,602	8,908	8,631,510	7,422,086	7,803	7,429,889
2014	8,068,907	8,435	8,077,342	8,860,859	9,155	8,870,014	7,457,520	7,840	7,465,360
2015	8,187,531	8,561	8,196,092	9,104,195	9,406	9,113,601	7,491,886	7,876	7,499,762
2016	8,306,066	8,685	8,314,751	9,352,144	9,662	9,361,806	7,524,752	7,911	7,532,662
2017	8,424,653	8,815	8,433,468	9,604,952	9,923	9,614,876	7,556,277	7,944	7,564,220
2018	8,543,014	8,942	8,551,955	9,862,372	10,189	9,872,561	7,586,227	7,975	7,594,202
2019	8,661,313	9,068	8,670,381	10,124,668	10,460	10,135,129	7,614,787	8,005	7,622,792
2020	8,779,748	9,199	8,788,947	10,392,165	10,737	10,402,901	7,642,150	8,034	7,650,184
2021	8,898,244	9,334	8,907,577	10,664,864	11,018	10,675,882	7,668,273	8,061	7,676,335
2022	9,017,006	9,456	9,026,462	10,943,084	11,306	10,954,390	7,693,339	8,088	7,701,427
2023	9,135,986	9,576	9,145,562	11,226,876	11,599	11,238,475	7,717,331	8,113	7,725,444
2024	9,254,836	9,698	9,264,534	11,515,911	11,898	11,527,809	7,739,981	8,137	7,748,118
2025	9,373,877	9,818	9,383,695	11,810,674	12,202	11,822,877	7,761,575	8,160	7,769,734
2026	9,492,971	9,935	9,502,907	12,111,093	12,513	12,123,606	7,782,017	8,181	7,790,198
2027	9,612,367	10,054	9,622,421	12,417,587	12,829	12,430,416	7,801,532	8,202	7,809,734
2028	9,731,876	10,183	9,742,059	12,730,029	13,152	12,743,181	7,819,991	8,221	7,828,212
2029	9,851,467	10,311	9,861,778	13,048,470	13,481	13,061,951	7,837,378	8,239	7,845,617
2030	9,971,183	10,432	9,981,614	13,373,063	13,816	13,386,880	7,853,738	8,256	7,861,994

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	1.29%	63.74%	1.33%	2.17%	63.74%	2.21%	0.41%	63.74%	0.45%
2009	1.28%	1.49%	1.28%	2.56%	2.56%	2.56%	0.27%	0.27%	0.27%
2010	1.17%	1.35%	1.17%	2.45%	2.45%	2.45%	0.17%	0.17%	0.17%
2011	1.59%	1.61%	1.59%	2.87%	2.87%	2.87%	0.58%	0.58%	0.58%
2012	1.53%	1.52%	1.53%	2.81%	2.81%	2.81%	0.52%	0.52%	0.52%
2013	1.51%	1.50%	1.51%	2.79%	2.79%	2.79%	0.50%	0.50%	0.50%
2014	1.49%	1.43%	1.49%	2.76%	2.76%	2.76%	0.48%	0.48%	0.48%
2015	1.47%	1.49%	1.47%	2.75%	2.75%	2.75%	0.46%	0.46%	0.46%
2016	1.45%	1.45%	1.45%	2.72%	2.72%	2.72%	0.44%	0.44%	0.44%
2017	1.43%	1.50%	1.43%	2.70%	2.70%	2.70%	0.42%	0.42%	0.42%
2018	1.40%	1.43%	1.40%	2.68%	2.68%	2.68%	0.40%	0.40%	0.40%
2019	1.38%	1.41%	1.38%	2.66%	2.66%	2.66%	0.38%	0.38%	0.38%
2020	1.37%	1.45%	1.37%	2.64%	2.64%	2.64%	0.36%	0.36%	0.36%
2021	1.35%	1.46%	1.35%	2.62%	2.62%	2.62%	0.34%	0.34%	0.34%
2022	1.33%	1.31%	1.33%	2.61%	2.61%	2.61%	0.33%	0.33%	0.33%
2023	1.32%	1.26%	1.32%	2.59%	2.59%	2.59%	0.31%	0.31%	0.31%
2024	1.30%	1.28%	1.30%	2.57%	2.57%	2.57%	0.29%	0.29%	0.29%
2025	1.29%	1.23%	1.29%	2.56%	2.56%	2.56%	0.28%	0.28%	0.28%
2026	1.27%	1.20%	1.27%	2.54%	2.54%	2.54%	0.26%	0.26%	0.26%
2027	1.26%	1.19%	1.26%	2.53%	2.53%	2.53%	0.25%	0.25%	0.25%
2028	1.24%	1.28%	1.24%	2.52%	2.52%	2.52%	0.24%	0.24%	0.24%
2029	1.23%	1.26%	1.23%	2.50%	2.50%	2.50%	0.22%	0.22%	0.22%
2030	1.22%	1.18%	1.22%	2.49%	2.49%	2.49%	0.21%	0.21%	0.21%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE 26**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms
Heating Season									
2008	7,722	72,630	80,352	7,799	73,356	81,156	7,645	71,904	79,549
2009	7,837	73,801	81,638	7,999	75,233	83,232	7,666	72,101	79,767
2010	7,942	75,069	83,011	8,194	77,075	85,269	7,678	72,221	79,899
2011	8,070	76,245	84,315	8,430	79,288	87,717	7,723	72,642	80,365
2012	8,193	77,529	85,722	8,667	81,516	90,182	7,764	73,021	80,785
2013	8,316	78,730	87,046	8,908	83,790	92,698	7,803	73,389	81,192
2014	8,435	79,950	88,385	9,155	86,105	95,260	7,840	73,740	81,580
2015	8,561	81,191	89,752	9,406	88,470	97,876	7,876	74,079	81,956
2016	8,685	82,411	91,096	9,662	90,879	100,541	7,911	74,404	82,315
2017	8,815	83,800	92,615	9,923	93,336	103,259	7,944	74,716	82,660
2018	8,942	85,097	94,038	10,189	95,837	106,027	7,975	75,012	82,988
2019	9,068	86,434	95,502	10,460	98,386	108,847	8,005	75,295	83,300
2020	9,199	87,887	97,087	10,737	100,986	111,722	8,034	75,565	83,599
2021	9,334	89,422	98,756	11,018	103,636	114,654	8,061	75,824	83,885
2022	9,456	90,655	100,111	11,306	106,339	117,645	8,088	76,071	84,159
2023	9,576	91,812	101,388	11,599	109,097	120,696	8,113	76,309	84,422
2024	9,698	93,070	102,768	11,898	111,906	123,803	8,137	76,533	84,669
2025	9,818	94,238	104,056	12,202	114,770	126,972	8,160	76,746	84,906
2026	9,935	95,369	105,305	12,513	117,689	130,202	8,181	76,948	85,129
2027	10,054	96,480	106,534	12,829	120,668	133,497	8,202	77,141	85,343
2028	10,183	97,813	107,996	13,152	123,704	136,856	8,221	77,324	85,545
2029	10,311	99,137	109,447	13,481	126,798	140,279	8,239	77,496	85,735
2030	10,432	100,342	110,774	13,816	129,953	143,769	8,256	77,657	85,914

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
	Daily Baseload Growth	Weather Sensitive Peak-Day Therms Growth	Total Core Peak-Day Therms Growth	Daily Baseload Growth	Weather Sensitive Peak-Day Therms Growth	Total Core Peak-Day Therms Growth	Daily Baseload Growth	Weather Sensitive Peak-Day Therms Growth	Total Core Peak-Day Therms Growth
Heating Season									
2008	63.74%	-4.58%	-0.60%	63.74%	-4.58%	-0.60%	63.74%	-4.58%	-0.60%
2009	1.49%	1.61%	1.60%	2.56%	2.56%	2.56%	0.27%	0.27%	0.27%
2010	1.35%	1.72%	1.68%	2.45%	2.45%	2.45%	0.17%	0.17%	0.17%
2011	1.61%	1.57%	1.57%	2.87%	2.87%	2.87%	0.58%	0.58%	0.58%
2012	1.52%	1.68%	1.67%	2.81%	2.81%	2.81%	0.52%	0.52%	0.52%
2013	1.50%	1.55%	1.54%	2.79%	2.79%	2.79%	0.50%	0.50%	0.50%
2014	1.43%	1.55%	1.54%	2.76%	2.76%	2.76%	0.48%	0.48%	0.48%
2015	1.49%	1.55%	1.55%	2.75%	2.75%	2.75%	0.46%	0.46%	0.46%
2016	1.45%	1.50%	1.50%	2.72%	2.72%	2.72%	0.44%	0.44%	0.44%
2017	1.50%	1.69%	1.67%	2.70%	2.70%	2.70%	0.42%	0.42%	0.42%
2018	1.43%	1.55%	1.54%	2.68%	2.68%	2.68%	0.40%	0.40%	0.40%
2019	1.41%	1.57%	1.56%	2.66%	2.66%	2.66%	0.38%	0.38%	0.38%
2020	1.45%	1.68%	1.66%	2.64%	2.64%	2.64%	0.36%	0.36%	0.36%
2021	1.46%	1.75%	1.72%	2.62%	2.62%	2.62%	0.34%	0.34%	0.34%
2022	1.31%	1.38%	1.37%	2.61%	2.61%	2.61%	0.33%	0.33%	0.33%
2023	1.26%	1.28%	1.28%	2.59%	2.59%	2.59%	0.31%	0.31%	0.31%
2024	1.28%	1.37%	1.36%	2.57%	2.57%	2.57%	0.29%	0.29%	0.29%
2025	1.23%	1.25%	1.25%	2.56%	2.56%	2.56%	0.28%	0.28%	0.28%
2026	1.20%	1.20%	1.20%	2.54%	2.54%	2.54%	0.26%	0.26%	0.26%
2027	1.19%	1.16%	1.17%	2.53%	2.53%	2.53%	0.25%	0.25%	0.25%
2028	1.28%	1.38%	1.37%	2.52%	2.52%	2.52%	0.24%	0.24%	0.24%
2029	1.26%	1.35%	1.34%	2.50%	2.50%	2.50%	0.22%	0.22%	0.22%
2030	1.18%	1.22%	1.21%	2.49%	2.49%	2.49%	0.21%	0.21%	0.21%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE 26**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	1,532,280	5,885,181	7,417,462	1,563,079	5,993,631	7,556,710	1,501,788	5,777,714	7,279,502
2009	1,558,160	5,954,499	7,512,659	1,609,472	6,140,577	7,750,050	1,511,957	5,787,530	7,299,487
2010	1,582,190	6,018,663	7,600,853	1,654,850	6,284,906	7,939,757	1,519,998	5,791,603	7,311,602
2011	1,608,910	6,113,042	7,721,952	1,703,964	6,463,740	8,167,704	1,530,288	5,823,905	7,354,193
2012	1,632,811	6,207,519	7,840,330	1,751,029	6,646,182	8,397,211	1,537,569	5,855,083	7,392,652
2013	1,656,779	6,302,219	7,958,998	1,799,081	6,832,429	8,631,510	1,544,615	5,885,274	7,429,889
2014	1,680,234	6,397,108	8,077,342	1,847,500	7,022,514	8,870,014	1,550,895	5,914,465	7,465,360
2015	1,703,859	6,492,233	8,196,092	1,897,043	7,216,559	9,113,601	1,557,053	5,942,709	7,499,762
2016	1,727,188	6,587,563	8,314,751	1,947,205	7,414,601	9,361,806	1,562,667	5,969,996	7,532,662
2017	1,750,366	6,683,103	8,433,468	1,998,158	7,616,718	9,614,876	1,567,880	5,996,341	7,564,220
2018	1,773,280	6,778,675	8,551,955	2,049,778	7,822,783	9,872,561	1,572,600	6,021,602	7,594,202
2019	1,795,654	6,874,727	8,670,381	2,101,750	8,033,379	10,135,129	1,576,597	6,046,195	7,622,792
2020	1,817,986	6,970,961	8,788,947	2,154,653	8,248,248	10,402,901	1,580,322	6,069,863	7,650,184
2021	1,840,246	7,067,331	8,907,577	2,208,470	8,467,412	10,675,882	1,583,755	6,092,580	7,676,335
2022	1,862,480	7,163,983	9,026,462	2,263,267	8,691,123	10,954,390	1,586,941	6,114,487	7,701,427
2023	1,884,694	7,260,869	9,145,562	2,319,069	8,919,406	11,238,475	1,589,890	6,135,554	7,725,444
2024	1,906,502	7,358,032	9,264,534	2,375,411	9,152,397	11,527,809	1,592,284	6,155,834	7,748,118
2025	1,928,247	7,455,447	9,383,695	2,432,725	9,390,151	11,822,877	1,594,421	6,175,313	7,769,734
2026	1,949,831	7,553,076	9,502,907	2,490,898	9,632,708	12,123,606	1,596,226	6,193,973	7,790,198
2027	1,971,412	7,651,009	9,622,421	2,550,146	9,880,269	12,430,416	1,597,835	6,211,899	7,809,734
2028	1,992,777	7,749,281	9,742,059	2,610,208	10,132,973	12,743,181	1,599,080	6,229,131	7,828,212
2029	2,013,930	7,847,847	9,861,778	2,671,096	10,390,855	13,061,951	1,599,974	6,245,643	7,845,617
2030	2,035,107	7,946,507	9,981,614	2,733,135	10,653,745	13,386,880	1,600,711	6,261,284	7,861,994

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	1.69%	1.18%	1.28%	2.97%	2.45%	2.56%	0.68%	0.17%	0.27%
2010	1.54%	1.08%	1.17%	2.82%	2.35%	2.45%	0.53%	0.07%	0.17%
2011	1.69%	1.57%	1.59%	2.97%	2.85%	2.87%	0.68%	0.56%	0.58%
2012	1.49%	1.55%	1.53%	2.76%	2.82%	2.81%	0.48%	0.54%	0.52%
2013	1.47%	1.53%	1.51%	2.74%	2.80%	2.79%	0.46%	0.52%	0.50%
2014	1.42%	1.51%	1.49%	2.69%	2.78%	2.76%	0.41%	0.50%	0.48%
2015	1.41%	1.49%	1.47%	2.68%	2.76%	2.75%	0.40%	0.48%	0.46%
2016	1.37%	1.47%	1.45%	2.64%	2.74%	2.72%	0.36%	0.46%	0.44%
2017	1.34%	1.45%	1.43%	2.62%	2.73%	2.70%	0.33%	0.44%	0.42%
2018	1.31%	1.43%	1.40%	2.58%	2.71%	2.68%	0.30%	0.42%	0.40%
2019	1.26%	1.42%	1.38%	2.54%	2.69%	2.66%	0.25%	0.41%	0.38%
2020	1.24%	1.40%	1.37%	2.52%	2.67%	2.64%	0.24%	0.39%	0.36%
2021	1.22%	1.38%	1.35%	2.50%	2.66%	2.62%	0.22%	0.37%	0.34%
2022	1.21%	1.37%	1.33%	2.48%	2.64%	2.61%	0.20%	0.36%	0.33%
2023	1.19%	1.35%	1.32%	2.47%	2.63%	2.59%	0.19%	0.34%	0.31%
2024	1.16%	1.34%	1.30%	2.43%	2.61%	2.57%	0.15%	0.33%	0.29%
2025	1.14%	1.32%	1.29%	2.41%	2.60%	2.56%	0.13%	0.32%	0.28%
2026	1.12%	1.31%	1.27%	2.39%	2.58%	2.54%	0.11%	0.30%	0.26%
2027	1.11%	1.30%	1.26%	2.38%	2.57%	2.53%	0.10%	0.29%	0.25%
2028	1.08%	1.28%	1.24%	2.36%	2.56%	2.52%	0.08%	0.28%	0.24%
2029	1.06%	1.27%	1.23%	2.33%	2.54%	2.50%	0.06%	0.27%	0.22%
2030	1.05%	1.26%	1.22%	2.32%	2.53%	2.49%	0.05%	0.25%	0.21%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE 26

Customer Forecast									
Year	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	2,588	1,154	3,742	2,614	1,166	3,780	2,562	1,143	3,705
2009	2,633	1,169	3,803	2,693	1,196	3,889	2,581	1,146	3,727
2010	2,675	1,184	3,859	2,770	1,226	3,996	2,596	1,149	3,745
2011	2,721	1,203	3,924	2,853	1,262	4,115	2,614	1,156	3,770
2012	2,762	1,222	3,984	2,933	1,297	4,231	2,628	1,162	3,790
2013	2,804	1,241	4,045	3,015	1,334	4,349	2,641	1,168	3,809
2014	2,845	1,260	4,104	3,097	1,371	4,468	2,652	1,174	3,827
2015	2,886	1,278	4,164	3,181	1,409	4,591	2,664	1,180	3,844
2016	2,927	1,297	4,224	3,267	1,448	4,715	2,675	1,185	3,860
2017	2,967	1,316	4,283	3,354	1,487	4,841	2,685	1,191	3,875
2018	3,007	1,335	4,342	3,442	1,528	4,969	2,694	1,196	3,890
2019	3,046	1,354	4,400	3,530	1,569	5,099	2,702	1,200	3,902
2020	3,085	1,372	4,458	3,621	1,610	5,231	2,709	1,205	3,914
2021	3,124	1,391	4,516	3,713	1,653	5,365	2,716	1,209	3,925
2022	3,163	1,410	4,573	3,806	1,696	5,502	2,723	1,213	3,936
2023	3,202	1,429	4,631	3,902	1,741	5,642	2,729	1,217	3,946
2024	3,241	1,447	4,688	3,998	1,786	5,784	2,734	1,221	3,955
2025	3,279	1,466	4,745	4,096	1,832	5,928	2,739	1,225	3,963
2026	3,317	1,485	4,802	4,196	1,878	6,074	2,743	1,228	3,971
2027	3,355	1,504	4,859	4,297	1,926	6,223	2,747	1,231	3,978
2028	3,393	1,523	4,915	4,400	1,975	6,375	2,750	1,234	3,984
2029	3,430	1,541	4,972	4,504	2,024	6,529	2,753	1,237	3,990
2030	3,468	1,560	5,028	4,611	2,075	6,686	2,755	1,240	3,995

Annual Growth Rates									
Year	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	1.82%	0.79%	1.50%	1.82%	0.79%	1.50%	1.82%	0.79%	1.50%
2009	1.73%	1.34%	1.61%	3.01%	2.61%	2.89%	0.72%	0.33%	0.60%
2010	1.58%	1.26%	1.48%	2.86%	2.53%	2.76%	0.57%	0.25%	0.47%
2011	1.73%	1.59%	1.69%	3.01%	2.87%	2.97%	0.72%	0.58%	0.67%
2012	1.53%	1.57%	1.54%	2.80%	2.84%	2.82%	0.52%	0.56%	0.53%
2013	1.51%	1.54%	1.52%	2.78%	2.82%	2.80%	0.50%	0.53%	0.51%
2014	1.46%	1.52%	1.47%	2.73%	2.79%	2.75%	0.45%	0.51%	0.46%
2015	1.45%	1.50%	1.46%	2.72%	2.77%	2.74%	0.44%	0.49%	0.45%
2016	1.41%	1.47%	1.43%	2.68%	2.75%	2.70%	0.40%	0.46%	0.42%
2017	1.38%	1.45%	1.40%	2.66%	2.73%	2.68%	0.37%	0.44%	0.39%
2018	1.35%	1.43%	1.37%	2.62%	2.70%	2.65%	0.34%	0.42%	0.36%
2019	1.30%	1.41%	1.33%	2.58%	2.68%	2.61%	0.29%	0.40%	0.33%
2020	1.28%	1.39%	1.32%	2.56%	2.66%	2.59%	0.28%	0.38%	0.31%
2021	1.26%	1.37%	1.30%	2.54%	2.64%	2.57%	0.26%	0.36%	0.29%
2022	1.25%	1.35%	1.28%	2.52%	2.63%	2.55%	0.24%	0.34%	0.27%
2023	1.23%	1.33%	1.26%	2.51%	2.61%	2.54%	0.23%	0.33%	0.26%
2024	1.20%	1.31%	1.23%	2.47%	2.59%	2.51%	0.19%	0.31%	0.23%
2025	1.18%	1.30%	1.22%	2.45%	2.57%	2.49%	0.17%	0.29%	0.21%
2026	1.16%	1.28%	1.20%	2.43%	2.56%	2.47%	0.15%	0.27%	0.19%
2027	1.15%	1.27%	1.18%	2.42%	2.54%	2.46%	0.14%	0.26%	0.18%
2028	1.12%	1.25%	1.16%	2.40%	2.52%	2.44%	0.12%	0.24%	0.16%
2029	1.10%	1.24%	1.14%	2.37%	2.51%	2.41%	0.10%	0.23%	0.14%
2030	1.09%	1.22%	1.13%	2.36%	2.49%	2.40%	0.09%	0.21%	0.13%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE 30-S**

Annual Requirements									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	41,283,643	36,986	41,320,629	42,084,049	37,356	42,121,405	40,490,912	36,616	40,527,528
2009	41,752,164	37,420	41,789,584	43,097,832	38,256	43,136,088	40,542,214	36,663	40,578,877
2010	42,251,729	37,881	42,289,610	44,162,906	39,202	44,202,107	40,618,335	36,732	40,655,066
2011	42,856,055	38,437	42,894,493	45,358,787	40,263	45,399,050	40,788,678	36,886	40,825,563
2012	43,550,987	39,075	43,590,062	46,674,919	41,431	46,716,351	41,036,940	37,110	41,074,051
2013	44,261,970	39,727	44,301,698	48,034,391	42,638	48,077,029	41,291,212	37,340	41,328,553
2014	44,972,543	40,380	45,012,923	49,420,193	43,868	49,464,061	41,536,011	37,562	41,573,573
2015	45,702,086	41,050	45,743,136	50,854,362	45,141	50,899,504	41,789,202	37,791	41,826,992
2016	46,435,009	41,724	46,476,733	52,320,583	46,443	52,367,026	42,036,316	38,014	42,074,330
2017	47,178,259	42,408	47,220,667	53,827,402	47,780	53,875,182	42,283,651	38,238	42,321,888
2018	47,923,724	43,094	47,966,818	55,366,400	49,146	55,415,546	42,523,875	38,455	42,562,330
2019	48,665,597	43,777	48,709,374	56,931,373	50,536	56,981,909	42,751,994	38,661	42,790,655
2020	49,418,171	44,471	49,462,642	58,539,623	51,963	58,591,586	42,980,680	38,868	43,019,548
2021	50,174,004	45,168	50,219,173	60,183,220	53,422	60,236,642	43,203,399	39,069	43,242,468
2022	50,938,835	45,874	50,984,709	61,869,840	54,919	61,924,759	43,425,094	39,270	43,464,364
2023	51,712,835	46,588	51,759,424	63,600,645	56,456	63,657,101	43,645,842	39,470	43,685,311
2024	52,483,584	47,301	52,530,885	65,361,136	58,018	65,419,155	43,855,192	39,659	43,894,851
2025	53,262,717	48,021	53,310,738	67,166,426	59,621	67,226,046	44,062,993	39,847	44,102,840
2026	54,045,776	48,745	54,094,521	69,011,798	61,259	69,073,057	44,265,536	40,030	44,305,566
2027	54,840,157	49,481	54,889,638	70,907,607	62,942	70,970,549	44,468,868	40,214	44,509,082
2028	55,636,357	50,218	55,686,575	72,842,556	64,659	72,907,216	44,665,240	40,391	44,705,631
2029	56,433,737	50,957	56,484,694	74,816,525	66,411	74,882,936	44,854,244	40,562	44,894,806
2030	57,316,008	51,774	57,367,782	76,942,635	68,299	77,010,933	45,101,838	40,786	45,142,624

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	1.35%	1.11%	1.35%	2.30%	1.11%	2.29%	0.41%	1.11%	0.41%
2009	1.13%	1.17%	1.13%	2.41%	2.41%	2.41%	0.13%	0.13%	0.13%
2010	1.20%	1.23%	1.20%	2.47%	2.47%	2.47%	0.19%	0.19%	0.19%
2011	1.43%	1.47%	1.43%	2.71%	2.71%	2.71%	0.42%	0.42%	0.42%
2012	1.62%	1.66%	1.62%	2.90%	2.90%	2.90%	0.61%	0.61%	0.61%
2013	1.63%	1.67%	1.63%	2.91%	2.91%	2.91%	0.62%	0.62%	0.62%
2014	1.61%	1.64%	1.61%	2.89%	2.89%	2.89%	0.59%	0.59%	0.59%
2015	1.62%	1.66%	1.62%	2.90%	2.90%	2.90%	0.61%	0.61%	0.61%
2016	1.60%	1.64%	1.60%	2.88%	2.88%	2.88%	0.59%	0.59%	0.59%
2017	1.60%	1.64%	1.60%	2.88%	2.88%	2.88%	0.59%	0.59%	0.59%
2018	1.58%	1.62%	1.58%	2.86%	2.86%	2.86%	0.57%	0.57%	0.57%
2019	1.55%	1.59%	1.55%	2.83%	2.83%	2.83%	0.54%	0.54%	0.54%
2020	1.55%	1.58%	1.55%	2.82%	2.82%	2.82%	0.53%	0.53%	0.53%
2021	1.53%	1.57%	1.53%	2.81%	2.81%	2.81%	0.52%	0.52%	0.52%
2022	1.52%	1.56%	1.52%	2.80%	2.80%	2.80%	0.51%	0.51%	0.51%
2023	1.52%	1.56%	1.52%	2.80%	2.80%	2.80%	0.51%	0.51%	0.51%
2024	1.49%	1.53%	1.49%	2.77%	2.77%	2.77%	0.48%	0.48%	0.48%
2025	1.48%	1.52%	1.48%	2.76%	2.76%	2.76%	0.47%	0.47%	0.47%
2026	1.47%	1.51%	1.47%	2.75%	2.75%	2.75%	0.46%	0.46%	0.46%
2027	1.47%	1.51%	1.47%	2.75%	2.75%	2.75%	0.46%	0.46%	0.46%
2028	1.45%	1.49%	1.45%	2.73%	2.73%	2.73%	0.44%	0.44%	0.44%
2029	1.43%	1.47%	1.43%	2.71%	2.71%	2.71%	0.42%	0.42%	0.42%
2030	1.56%	1.60%	1.56%	2.84%	2.84%	2.84%	0.55%	0.55%	0.55%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE 30-S**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	36,986	392,890	429,876	37,356	396,818	434,175	36,616	388,961	425,577
2009	37,420	396,943	434,363	38,256	406,378	444,634	36,663	389,454	426,116
2010	37,881	401,486	439,368	39,202	416,420	455,622	36,732	390,185	426,916
2011	38,437	406,379	444,817	40,263	427,697	467,960	36,886	391,821	428,707
2012	39,075	412,098	451,173	41,431	440,107	481,538	37,110	394,206	431,316
2013	39,727	418,933	458,660	42,638	452,925	495,563	37,340	396,648	433,989
2014	40,380	425,969	466,349	43,868	465,992	509,861	37,562	399,000	436,562
2015	41,050	432,948	473,998	45,141	479,515	524,657	37,791	401,432	439,223
2016	41,724	440,155	481,879	46,443	493,341	539,783	38,014	403,806	441,820
2017	42,408	447,389	489,797	47,780	507,549	555,329	38,238	406,182	444,420
2018	43,094	454,728	497,822	49,146	522,060	571,207	38,455	408,490	446,945
2019	43,777	462,113	505,891	50,536	536,817	587,352	38,661	410,681	449,342
2020	44,471	469,434	513,905	51,963	551,981	603,944	38,868	412,878	451,746
2021	45,168	476,846	522,014	53,422	567,479	620,901	39,069	415,017	454,087
2022	45,874	484,297	530,171	54,919	583,382	638,302	39,270	417,147	456,417
2023	46,588	491,849	538,437	56,456	599,703	656,158	39,470	419,267	458,737
2024	47,301	499,530	546,831	58,018	616,303	674,321	39,659	421,278	460,937
2025	48,021	507,150	555,171	59,621	633,325	692,946	39,847	423,275	463,121
2026	48,745	514,868	563,613	61,259	650,725	711,984	40,030	425,220	465,250
2027	49,481	522,613	572,093	62,942	668,601	731,543	40,214	427,173	467,387
2028	50,218	530,499	580,717	64,659	686,846	751,506	40,391	429,060	469,451
2029	50,957	538,401	589,358	66,411	705,459	771,871	40,562	430,875	471,438
2030	51,774	546,098	597,872	68,299	725,507	793,805	40,786	433,254	474,040

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	1.11%	-5.06%	-4.56%	1.11%	-5.06%	-4.56%	1.11%	-5.06%	-4.56%
2009	1.17%	1.03%	1.04%	2.41%	2.41%	2.41%	0.13%	0.13%	0.13%
2010	1.23%	1.14%	1.15%	2.47%	2.47%	2.47%	0.19%	0.19%	0.19%
2011	1.47%	1.22%	1.24%	2.71%	2.71%	2.71%	0.42%	0.42%	0.42%
2012	1.66%	1.41%	1.43%	2.90%	2.90%	2.90%	0.61%	0.61%	0.61%
2013	1.67%	1.66%	1.66%	2.91%	2.91%	2.91%	0.62%	0.62%	0.62%
2014	1.64%	1.68%	1.68%	2.89%	2.89%	2.89%	0.59%	0.59%	0.59%
2015	1.66%	1.64%	1.64%	2.90%	2.90%	2.90%	0.61%	0.61%	0.61%
2016	1.64%	1.66%	1.66%	2.88%	2.88%	2.88%	0.59%	0.59%	0.59%
2017	1.64%	1.64%	1.64%	2.88%	2.88%	2.88%	0.59%	0.59%	0.59%
2018	1.62%	1.64%	1.64%	2.86%	2.86%	2.86%	0.57%	0.57%	0.57%
2019	1.59%	1.62%	1.62%	2.83%	2.83%	2.83%	0.54%	0.54%	0.54%
2020	1.58%	1.58%	1.58%	2.82%	2.82%	2.82%	0.53%	0.53%	0.53%
2021	1.57%	1.58%	1.58%	2.81%	2.81%	2.81%	0.52%	0.52%	0.52%
2022	1.56%	1.56%	1.56%	2.80%	2.80%	2.80%	0.51%	0.51%	0.51%
2023	1.56%	1.56%	1.56%	2.80%	2.80%	2.80%	0.51%	0.51%	0.51%
2024	1.53%	1.56%	1.56%	2.77%	2.77%	2.77%	0.48%	0.48%	0.48%
2025	1.52%	1.53%	1.53%	2.76%	2.76%	2.76%	0.47%	0.47%	0.47%
2026	1.51%	1.52%	1.52%	2.75%	2.75%	2.75%	0.46%	0.46%	0.46%
2027	1.51%	1.50%	1.50%	2.75%	2.75%	2.75%	0.46%	0.46%	0.46%
2028	1.49%	1.51%	1.51%	2.73%	2.73%	2.73%	0.44%	0.44%	0.44%
2029	1.47%	1.49%	1.49%	2.71%	2.71%	2.71%	0.42%	0.42%	0.42%
2030	1.60%	1.43%	1.44%	2.84%	2.84%	2.84%	0.55%	0.55%	0.55%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE 30-S**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	24,943,584	16,377,045	41,320,629	25,444,950	16,676,455	42,121,405	24,447,207	16,080,321	40,527,528
2009	25,307,370	16,482,214	41,789,584	26,140,774	16,995,315	43,136,088	24,556,951	16,021,926	40,578,877
2010	25,702,421	16,587,189	42,289,610	26,882,778	17,319,330	44,202,107	24,692,129	15,962,938	40,655,066
2011	26,176,000	16,718,492	42,894,493	27,722,480	17,676,570	45,399,050	24,896,875	15,928,688	40,825,563
2012	26,735,225	16,854,837	43,590,062	28,670,899	18,045,451	46,716,351	25,175,752	15,898,299	41,074,051
2013	27,308,130	16,993,568	44,301,698	29,653,647	18,423,382	48,077,029	25,459,368	15,869,184	41,328,553
2014	27,879,589	17,133,334	45,012,923	30,654,991	18,809,070	49,464,061	25,733,513	15,840,060	41,573,573
2015	28,468,118	17,275,018	45,743,136	31,695,841	19,203,663	50,899,504	26,015,282	15,811,710	41,826,992
2016	29,059,208	17,417,525	46,476,733	32,760,911	19,606,115	52,367,026	26,291,212	15,783,118	42,074,330
2017	29,658,724	17,561,943	47,220,667	33,857,379	20,017,803	53,875,182	26,566,622	15,755,266	42,321,888
2018	30,260,647	17,706,172	47,966,818	34,979,030	20,436,516	55,415,546	26,836,084	15,726,246	42,562,330
2019	30,858,949	17,850,424	48,709,374	36,119,304	20,862,604	56,981,909	27,094,375	15,696,280	42,790,655
2020	31,466,956	17,995,686	49,462,642	37,294,231	21,297,355	58,591,586	27,353,304	15,666,244	43,019,548
2021	32,081,103	18,138,069	50,219,173	38,500,370	21,736,272	60,236,642	27,609,682	15,632,786	43,242,468
2022	32,704,733	18,279,976	50,984,709	39,742,473	22,182,286	61,924,759	27,866,330	15,598,034	43,464,364
2023	33,337,427	18,421,997	51,759,424	41,020,887	22,636,214	63,657,101	28,122,783	15,562,528	43,685,311
2024	33,966,836	18,564,049	52,530,885	42,321,079	23,098,075	65,419,155	28,368,630	15,526,221	43,894,851
2025	34,604,578	18,706,160	53,310,738	43,658,004	23,568,042	67,226,046	28,613,691	15,489,149	44,102,840
2026	35,246,220	18,848,301	54,094,521	45,026,849	24,046,208	69,073,057	28,854,259	15,451,307	44,305,566
2027	35,898,700	18,990,938	54,889,638	46,437,241	24,533,308	70,970,549	29,095,991	15,413,091	44,509,082
2028	36,552,649	19,133,926	55,686,575	47,877,914	25,029,301	72,907,216	29,331,235	15,374,397	44,705,631
2029	37,208,067	19,276,627	56,484,694	49,349,432	25,533,504	74,882,936	29,560,084	15,334,723	44,894,806
2030	37,948,405	19,419,377	57,367,782	50,964,440	26,046,494	77,010,933	29,848,267	15,294,357	45,142,624

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	1.46%	0.64%	1.13%	2.73%	1.91%	2.41%	0.45%	-0.36%	0.13%
2010	1.56%	0.64%	1.20%	2.84%	1.91%	2.47%	0.55%	-0.37%	0.19%
2011	1.84%	0.79%	1.43%	3.12%	2.06%	2.71%	0.83%	-0.21%	0.42%
2012	2.14%	0.82%	1.62%	3.42%	2.09%	2.90%	1.12%	-0.19%	0.61%
2013	2.14%	0.82%	1.63%	3.43%	2.09%	2.91%	1.13%	-0.18%	0.62%
2014	2.09%	0.82%	1.61%	3.38%	2.09%	2.89%	1.08%	-0.18%	0.59%
2015	2.11%	0.83%	1.62%	3.40%	2.10%	2.90%	1.09%	-0.18%	0.61%
2016	2.08%	0.82%	1.60%	3.36%	2.10%	2.88%	1.06%	-0.18%	0.59%
2017	2.06%	0.83%	1.60%	3.35%	2.10%	2.88%	1.05%	-0.18%	0.59%
2018	2.03%	0.82%	1.58%	3.31%	2.09%	2.86%	1.01%	-0.18%	0.57%
2019	1.98%	0.81%	1.55%	3.26%	2.08%	2.83%	0.96%	-0.19%	0.54%
2020	1.97%	0.81%	1.55%	3.25%	2.08%	2.82%	0.96%	-0.19%	0.53%
2021	1.95%	0.79%	1.53%	3.23%	2.06%	2.81%	0.94%	-0.21%	0.52%
2022	1.94%	0.78%	1.52%	3.23%	2.05%	2.80%	0.93%	-0.22%	0.51%
2023	1.93%	0.78%	1.52%	3.22%	2.05%	2.80%	0.92%	-0.23%	0.51%
2024	1.89%	0.77%	1.49%	3.17%	2.04%	2.77%	0.87%	-0.23%	0.48%
2025	1.88%	0.77%	1.48%	3.16%	2.03%	2.76%	0.86%	-0.24%	0.47%
2026	1.85%	0.76%	1.47%	3.14%	2.03%	2.75%	0.84%	-0.24%	0.46%
2027	1.85%	0.76%	1.47%	3.13%	2.03%	2.75%	0.84%	-0.25%	0.46%
2028	1.82%	0.75%	1.45%	3.10%	2.02%	2.73%	0.81%	-0.25%	0.44%
2029	1.79%	0.75%	1.43%	3.07%	2.01%	2.71%	0.78%	-0.26%	0.42%
2030	1.99%	0.74%	1.56%	3.27%	2.01%	2.84%	0.97%	-0.26%	0.55%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE 30-S

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	33,347	3,564	36,911	33,681	3,600	37,280	33,014	3,529	36,542
2009	33,847	3,605	37,452	34,615	3,687	38,302	33,175	3,533	36,708
2010	34,389	3,645	38,034	35,612	3,775	39,386	33,371	3,537	36,908
2011	35,036	3,689	38,725	36,739	3,868	40,607	33,660	3,544	37,205
2012	35,799	3,734	39,533	38,010	3,965	41,975	34,051	3,552	37,603
2013	36,580	3,779	40,359	39,329	4,063	43,392	34,448	3,559	38,007
2014	37,360	3,824	41,184	40,673	4,163	44,836	34,833	3,565	38,398
2015	38,164	3,869	42,033	42,070	4,265	46,335	35,228	3,571	38,799
2016	38,972	3,913	42,885	43,501	4,368	47,869	35,616	3,576	39,192
2017	39,791	3,958	43,749	44,975	4,473	49,448	36,003	3,581	39,584
2018	40,615	4,002	44,617	46,483	4,580	51,063	36,382	3,585	39,967
2019	41,434	4,046	45,480	48,017	4,688	52,705	36,747	3,588	40,335
2020	42,267	4,089	46,357	49,598	4,799	54,397	37,113	3,591	40,703
2021	43,109	4,132	47,241	51,223	4,910	56,132	37,475	3,592	41,067
2022	43,964	4,175	48,139	52,896	5,023	57,919	37,839	3,593	41,431
2023	44,832	4,217	49,050	54,619	5,138	59,757	38,202	3,593	41,795
2024	45,697	4,259	49,956	56,372	5,254	61,627	38,551	3,593	42,144
2025	46,573	4,301	50,875	58,176	5,373	63,549	38,899	3,593	42,492
2026	47,455	4,343	51,799	60,024	5,494	65,518	39,242	3,592	42,833
2027	48,353	4,386	52,738	61,928	5,617	67,545	39,586	3,590	43,176
2028	49,253	4,427	53,681	63,875	5,742	69,616	39,922	3,589	43,510
2029	50,156	4,469	54,625	65,864	5,869	71,732	40,249	3,586	43,835
2030	51,174	4,511	55,685	68,046	5,998	74,044	40,657	3,584	44,241

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	1.32%	1.26%	1.32%	1.32%	1.26%	1.32%	1.32%	1.26%	1.32%
2009	1.50%	1.14%	1.46%	2.78%	2.41%	2.74%	0.49%	0.13%	0.45%
2010	1.60%	1.11%	1.55%	2.88%	2.38%	2.83%	0.59%	0.10%	0.54%
2011	1.88%	1.21%	1.82%	3.16%	2.48%	3.10%	0.87%	0.20%	0.80%
2012	2.18%	1.22%	2.09%	3.46%	2.50%	3.37%	1.16%	0.22%	1.07%
2013	2.18%	1.21%	2.09%	3.47%	2.48%	3.38%	1.17%	0.20%	1.08%
2014	2.13%	1.18%	2.04%	3.42%	2.45%	3.33%	1.12%	0.18%	1.03%
2015	2.15%	1.17%	2.06%	3.44%	2.44%	3.34%	1.13%	0.16%	1.04%
2016	2.12%	1.15%	2.03%	3.40%	2.42%	3.31%	1.10%	0.15%	1.01%
2017	2.10%	1.14%	2.01%	3.39%	2.41%	3.30%	1.09%	0.13%	1.00%
2018	2.07%	1.12%	1.98%	3.35%	2.39%	3.27%	1.05%	0.11%	0.97%
2019	2.02%	1.09%	1.93%	3.30%	2.37%	3.22%	1.00%	0.09%	0.92%
2020	2.01%	1.08%	1.93%	3.29%	2.35%	3.21%	1.00%	0.07%	0.91%
2021	1.99%	1.04%	1.91%	3.27%	2.31%	3.19%	0.98%	0.04%	0.89%
2022	1.98%	1.03%	1.90%	3.27%	2.30%	3.18%	0.97%	0.03%	0.89%
2023	1.97%	1.02%	1.89%	3.26%	2.29%	3.17%	0.96%	0.01%	0.88%
2024	1.93%	1.00%	1.85%	3.21%	2.27%	3.13%	0.91%	0.00%	0.83%
2025	1.92%	0.99%	1.84%	3.20%	2.26%	3.12%	0.90%	-0.02%	0.83%
2026	1.89%	0.98%	1.82%	3.18%	2.25%	3.10%	0.88%	-0.03%	0.80%
2027	1.89%	0.97%	1.81%	3.17%	2.24%	3.09%	0.88%	-0.04%	0.80%
2028	1.86%	0.95%	1.79%	3.14%	2.22%	3.07%	0.85%	-0.05%	0.77%
2029	1.83%	0.94%	1.76%	3.11%	2.21%	3.04%	0.82%	-0.06%	0.75%
2030	2.03%	0.93%	1.94%	3.31%	2.20%	3.22%	1.01%	-0.07%	0.93%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE 30-W**

Heating Season	Annual Requirements								
	Medium Forecast			High Forecast			Low Forecast		
	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	88,945,777	71,856	89,017,633	90,696,861	72,575	90,769,436	87,211,755	71,137	87,282,893
2009	90,880,303	73,681	90,953,984	93,836,376	75,087	93,911,463	88,221,223	71,961	88,293,184
2010	92,894,123	75,609	92,969,732	97,123,608	77,717	97,201,325	89,278,078	72,823	89,350,901
2011	95,053,373	77,650	95,131,023	100,632,298	80,525	100,712,822	90,443,863	73,774	90,517,637
2012	97,171,778	79,679	97,251,457	104,170,391	83,356	104,253,747	91,538,913	74,667	91,613,580
2013	99,299,119	81,721	99,380,840	107,791,256	86,253	107,877,509	92,611,574	75,542	92,687,116
2014	101,437,895	83,765	101,521,660	111,499,058	89,220	111,588,278	93,664,576	76,401	93,740,977
2015	103,578,723	85,824	103,664,547	115,285,478	92,250	115,377,728	94,689,259	77,237	94,766,496
2016	105,720,570	87,889	105,808,458	119,150,605	95,343	119,245,948	95,685,256	78,049	95,763,305
2017	107,892,028	89,962	107,981,990	123,128,183	98,526	123,226,709	96,678,830	78,860	96,757,690
2018	110,090,028	92,083	110,182,111	127,217,753	101,798	127,319,552	97,666,666	79,665	97,746,332
2019	112,295,636	94,206	112,389,842	131,399,408	105,144	131,504,552	98,632,113	80,453	98,712,566
2020	114,522,119	96,340	114,618,459	135,690,666	108,578	135,799,244	99,586,968	81,232	99,668,200
2021	116,760,945	98,482	116,859,427	140,083,757	112,093	140,195,850	100,523,780	81,996	100,605,776
2022	118,967,542	100,634	119,068,177	144,527,209	115,649	144,642,857	101,404,352	82,714	101,487,066
2023	121,166,701	102,796	121,269,497	149,051,269	119,269	149,170,538	102,251,099	83,405	102,334,504
2024	123,380,352	104,961	123,485,313	153,684,039	122,976	153,807,015	103,083,246	84,084	103,167,329
2025	125,590,883	107,136	125,698,019	158,405,925	126,755	158,532,680	103,886,089	84,738	103,970,828
2026	127,800,169	109,318	127,909,487	163,220,697	130,607	163,351,304	104,661,742	85,371	104,747,113
2027	130,008,881	111,510	130,120,392	168,130,873	134,536	168,265,409	105,411,173	85,982	105,497,156
2028	132,248,067	113,709	132,361,776	173,178,202	138,575	173,316,777	106,160,040	86,593	106,246,634
2029	134,488,823	115,912	134,604,735	178,327,921	142,696	178,470,617	106,884,862	87,185	106,972,046
2030	136,725,569	118,127	136,843,696	183,574,546	146,894	183,721,440	107,581,536	87,753	107,669,288

Heating Season	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	-1.40%	0.34%	-1.40%	-0.45%	0.34%	-0.45%	-2.34%	0.34%	-2.34%
2009	2.17%	2.54%	2.18%	3.46%	3.46%	3.46%	1.16%	1.16%	1.16%
2010	2.22%	2.62%	2.22%	3.50%	3.50%	3.50%	1.20%	1.20%	1.20%
2011	2.32%	2.70%	2.32%	3.61%	3.61%	3.61%	1.31%	1.31%	1.31%
2012	2.23%	2.61%	2.23%	3.52%	3.52%	3.52%	1.21%	1.21%	1.21%
2013	2.19%	2.56%	2.19%	3.48%	3.48%	3.48%	1.17%	1.17%	1.17%
2014	2.15%	2.50%	2.15%	3.44%	3.44%	3.44%	1.14%	1.14%	1.14%
2015	2.11%	2.46%	2.11%	3.40%	3.40%	3.40%	1.09%	1.09%	1.09%
2016	2.07%	2.41%	2.07%	3.35%	3.35%	3.35%	1.05%	1.05%	1.05%
2017	2.05%	2.36%	2.05%	3.34%	3.34%	3.34%	1.04%	1.04%	1.04%
2018	2.04%	2.36%	2.04%	3.32%	3.32%	3.32%	1.02%	1.02%	1.02%
2019	2.00%	2.31%	2.00%	3.29%	3.29%	3.29%	0.99%	0.99%	0.99%
2020	1.98%	2.26%	1.98%	3.27%	3.27%	3.27%	0.97%	0.97%	0.97%
2021	1.95%	2.22%	1.96%	3.24%	3.24%	3.24%	0.94%	0.94%	0.94%
2022	1.89%	2.19%	1.89%	3.17%	3.17%	3.17%	0.88%	0.88%	0.88%
2023	1.85%	2.15%	1.85%	3.13%	3.13%	3.13%	0.84%	0.84%	0.84%
2024	1.83%	2.11%	1.83%	3.11%	3.11%	3.11%	0.81%	0.81%	0.81%
2025	1.79%	2.07%	1.79%	3.07%	3.07%	3.07%	0.78%	0.78%	0.78%
2026	1.76%	2.04%	1.76%	3.04%	3.04%	3.04%	0.75%	0.75%	0.75%
2027	1.73%	2.01%	1.73%	3.01%	3.01%	3.01%	0.72%	0.72%	0.72%
2028	1.72%	1.97%	1.72%	3.00%	3.00%	3.00%	0.71%	0.71%	0.71%
2029	1.69%	1.94%	1.69%	2.97%	2.97%	2.97%	0.68%	0.68%	0.68%
2030	1.66%	1.91%	1.66%	2.94%	2.94%	2.94%	0.65%	0.65%	0.65%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE 30-W**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	71,856	920,280	992,136	72,575	929,482	1,002,057	71,137	911,077	982,214
2009	73,681	941,324	1,015,005	75,087	961,657	1,036,744	71,961	921,622	993,583
2010	75,609	964,099	1,039,708	77,717	995,345	1,073,062	72,823	932,663	1,005,486
2011	77,650	988,265	1,065,915	80,525	1,031,303	1,111,828	73,774	944,842	1,018,616
2012	79,679	1,013,368	1,093,047	83,356	1,067,562	1,150,918	74,667	956,281	1,030,948
2013	81,721	1,038,375	1,120,096	86,253	1,104,670	1,190,923	75,542	967,487	1,043,029
2014	83,765	1,063,544	1,147,309	89,220	1,142,668	1,231,888	76,401	978,488	1,054,889
2015	85,824	1,088,726	1,174,550	92,250	1,181,472	1,273,722	77,237	989,192	1,066,429
2016	87,889	1,114,048	1,201,937	95,343	1,221,083	1,316,426	78,049	999,597	1,077,646
2017	89,962	1,139,526	1,229,488	98,526	1,261,846	1,360,372	78,860	1,009,977	1,088,836
2018	92,083	1,165,135	1,257,218	101,798	1,303,757	1,405,555	79,665	1,020,296	1,099,962
2019	94,206	1,191,226	1,285,432	105,144	1,346,612	1,451,756	80,453	1,030,382	1,110,835
2020	96,340	1,217,397	1,313,737	108,578	1,390,589	1,499,167	81,232	1,040,357	1,121,589
2021	98,482	1,243,705	1,342,187	112,093	1,435,611	1,547,704	81,996	1,050,144	1,132,140
2022	100,634	1,269,964	1,370,598	115,649	1,481,148	1,596,797	82,714	1,059,343	1,142,057
2023	102,796	1,296,287	1,399,083	119,269	1,527,512	1,646,781	83,405	1,068,189	1,151,593
2024	104,961	1,322,752	1,427,713	122,976	1,574,990	1,697,966	84,084	1,076,882	1,160,965
2025	107,136	1,349,220	1,456,357	126,755	1,623,381	1,750,135	84,738	1,085,269	1,170,007
2026	109,318	1,375,774	1,485,092	130,607	1,672,723	1,803,331	85,371	1,093,372	1,178,743
2027	111,510	1,402,377	1,513,887	134,536	1,723,044	1,857,580	85,982	1,101,201	1,187,184
2028	113,709	1,429,190	1,542,899	138,575	1,774,770	1,913,345	86,593	1,109,024	1,195,618
2029	115,912	1,456,061	1,571,973	142,696	1,827,546	1,970,242	87,185	1,116,596	1,203,781
2030	118,127	1,482,952	1,601,079	146,894	1,881,314	2,028,209	87,753	1,123,874	1,211,627

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms	Daily Baseload	Weather Sensitive Peak-Day Therms	Total Core Peak-Day Therms
Heating Season	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth
2008	0.34%	-19.97%	-18.78%	0.34%	-19.97%	-18.78%	0.34%	-19.97%	-18.78%
2009	2.54%	2.29%	2.31%	3.46%	3.46%	3.46%	1.16%	1.16%	1.16%
2010	2.62%	2.42%	2.43%	3.50%	3.50%	3.50%	1.20%	1.20%	1.20%
2011	2.70%	2.51%	2.52%	3.61%	3.61%	3.61%	1.31%	1.31%	1.31%
2012	2.61%	2.54%	2.55%	3.52%	3.52%	3.52%	1.21%	1.21%	1.21%
2013	2.56%	2.47%	2.47%	3.48%	3.48%	3.48%	1.17%	1.17%	1.17%
2014	2.50%	2.42%	2.43%	3.44%	3.44%	3.44%	1.14%	1.14%	1.14%
2015	2.46%	2.37%	2.37%	3.40%	3.40%	3.40%	1.09%	1.09%	1.09%
2016	2.41%	2.33%	2.33%	3.35%	3.35%	3.35%	1.05%	1.05%	1.05%
2017	2.36%	2.29%	2.29%	3.34%	3.34%	3.34%	1.04%	1.04%	1.04%
2018	2.36%	2.25%	2.26%	3.32%	3.32%	3.32%	1.02%	1.02%	1.02%
2019	2.31%	2.24%	2.24%	3.29%	3.29%	3.29%	0.99%	0.99%	0.99%
2020	2.26%	2.20%	2.20%	3.27%	3.27%	3.27%	0.97%	0.97%	0.97%
2021	2.22%	2.16%	2.17%	3.24%	3.24%	3.24%	0.94%	0.94%	0.94%
2022	2.19%	2.11%	2.12%	3.17%	3.17%	3.17%	0.88%	0.88%	0.88%
2023	2.15%	2.07%	2.08%	3.13%	3.13%	3.13%	0.84%	0.84%	0.84%
2024	2.11%	2.04%	2.05%	3.11%	3.11%	3.11%	0.81%	0.81%	0.81%
2025	2.07%	2.00%	2.01%	3.07%	3.07%	3.07%	0.78%	0.78%	0.78%
2026	2.04%	1.97%	1.97%	3.04%	3.04%	3.04%	0.75%	0.75%	0.75%
2027	2.01%	1.93%	1.94%	3.01%	3.01%	3.01%	0.72%	0.72%	0.72%
2028	1.97%	1.91%	1.92%	3.00%	3.00%	3.00%	0.71%	0.71%	0.71%
2029	1.94%	1.88%	1.88%	2.97%	2.97%	2.97%	0.68%	0.68%	0.68%
2030	1.91%	1.85%	1.85%	2.94%	2.94%	2.94%	0.65%	0.65%	0.65%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE 30-W**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	56,090,277	32,927,356	89,017,633	57,217,692	33,551,744	90,769,436	54,974,080	32,308,812	87,282,893
2009	57,467,958	33,486,026	90,953,984	59,360,451	34,551,012	93,911,463	55,763,909	32,529,275	88,293,184
2010	58,929,771	34,039,961	92,969,732	61,636,059	35,565,265	97,201,325	56,613,402	32,737,499	89,350,901
2011	60,478,852	34,652,171	95,131,023	64,051,947	36,660,876	100,712,822	57,523,473	32,994,164	90,517,637
2012	62,012,308	35,239,150	97,251,457	66,502,101	37,751,646	104,253,747	58,395,113	33,218,467	91,613,580
2013	63,552,064	35,828,776	99,380,840	69,010,602	38,866,907	107,877,509	59,249,587	33,437,529	92,687,116
2014	65,090,508	36,431,152	101,521,660	71,570,244	40,018,035	111,588,278	60,080,063	33,660,913	93,740,977
2015	66,636,764	37,027,783	103,664,547	74,192,057	41,185,671	115,377,728	60,895,286	33,871,210	94,766,496
2016	68,184,239	37,624,219	105,808,458	76,869,879	42,376,069	119,245,948	61,689,440	34,073,864	95,763,305
2017	69,734,946	38,247,044	107,981,990	79,607,016	43,619,693	123,226,709	62,464,656	34,293,033	96,757,690
2018	71,323,340	38,858,771	110,182,111	82,444,413	44,875,139	127,319,552	63,251,760	34,494,572	97,746,332
2019	72,909,621	39,480,221	112,389,842	85,338,122	46,166,430	131,504,552	64,015,160	34,697,405	98,712,566
2020	74,500,227	40,118,232	114,618,459	88,296,709	47,502,535	135,799,244	64,760,866	34,907,333	99,668,200
2021	76,093,604	40,765,822	116,859,427	91,319,549	48,876,302	140,195,850	65,487,779	35,117,997	100,605,776
2022	77,691,306	41,376,871	119,068,177	94,409,719	50,233,139	144,642,857	66,197,499	35,289,567	101,487,066
2023	79,292,612	41,976,885	121,269,497	97,567,615	51,602,923	149,170,538	66,889,653	35,444,851	102,334,504
2024	80,892,416	42,592,897	123,485,313	100,788,145	53,018,870	153,807,015	67,560,224	35,607,105	103,167,329
2025	82,496,009	43,202,010	125,698,019	104,079,037	54,453,643	158,532,680	68,213,961	35,756,867	103,970,828
2026	84,100,692	43,808,795	127,909,487	107,438,164	55,913,140	163,351,304	68,848,892	35,898,222	104,747,113
2027	85,709,794	44,410,598	130,120,392	110,871,044	57,394,365	168,265,409	69,468,015	36,029,141	105,497,156
2028	87,319,480	45,042,297	132,361,776	114,374,052	58,942,725	173,316,777	70,068,469	36,178,164	106,246,634
2029	88,928,910	45,675,825	134,604,735	117,947,304	60,523,313	178,470,617	70,649,895	36,322,151	106,972,046
2030	90,542,632	46,301,064	136,843,696	121,598,116	62,123,324	183,721,440	71,216,187	36,453,101	107,669,288

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	2.46%	1.70%	2.18%	3.74%	2.98%	3.46%	1.44%	0.68%	1.16%
2010	2.54%	1.65%	2.22%	3.83%	2.94%	3.50%	1.52%	0.64%	1.20%
2011	2.63%	1.80%	2.32%	3.92%	3.08%	3.61%	1.61%	0.78%	1.31%
2012	2.54%	1.69%	2.23%	3.83%	2.98%	3.52%	1.52%	0.68%	1.21%
2013	2.48%	1.67%	2.19%	3.77%	2.95%	3.48%	1.46%	0.66%	1.17%
2014	2.42%	1.68%	2.15%	3.71%	2.96%	3.44%	1.40%	0.67%	1.14%
2015	2.38%	1.64%	2.11%	3.66%	2.92%	3.40%	1.36%	0.62%	1.09%
2016	2.32%	1.61%	2.07%	3.61%	2.89%	3.35%	1.30%	0.60%	1.05%
2017	2.27%	1.66%	2.05%	3.56%	2.93%	3.34%	1.26%	0.64%	1.04%
2018	2.28%	1.60%	2.04%	3.56%	2.88%	3.32%	1.26%	0.59%	1.02%
2019	2.22%	1.60%	2.00%	3.51%	2.88%	3.29%	1.21%	0.59%	0.99%
2020	2.18%	1.62%	1.98%	3.47%	2.89%	3.27%	1.16%	0.61%	0.97%
2021	2.14%	1.61%	1.96%	3.42%	2.89%	3.24%	1.12%	0.60%	0.94%
2022	2.10%	1.50%	1.89%	3.38%	2.78%	3.17%	1.08%	0.49%	0.88%
2023	2.06%	1.45%	1.85%	3.34%	2.73%	3.13%	1.05%	0.44%	0.84%
2024	2.02%	1.47%	1.83%	3.30%	2.74%	3.11%	1.00%	0.46%	0.81%
2025	1.98%	1.43%	1.79%	3.27%	2.71%	3.07%	0.97%	0.42%	0.78%
2026	1.95%	1.40%	1.76%	3.23%	2.68%	3.04%	0.93%	0.40%	0.75%
2027	1.91%	1.37%	1.73%	3.20%	2.65%	3.01%	0.90%	0.36%	0.72%
2028	1.88%	1.42%	1.72%	3.16%	2.70%	3.00%	0.86%	0.41%	0.71%
2029	1.84%	1.41%	1.69%	3.12%	2.68%	2.97%	0.83%	0.40%	0.68%
2030	1.81%	1.37%	1.66%	3.10%	2.64%	2.94%	0.80%	0.36%	0.65%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE 30-W

Year	Customer Forecast								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	75,492	9,233	84,725	76,247	9,325	85,572	74,737	9,141	83,877
2009	77,445	9,432	86,877	79,203	9,646	88,849	75,907	9,245	85,152
2010	79,516	9,633	89,150	82,345	9,976	92,321	77,162	9,348	86,511
2011	81,711	9,845	91,556	85,682	10,324	96,006	78,503	9,459	87,962
2012	83,890	10,059	93,949	89,073	10,680	99,753	79,795	9,568	89,362
2013	86,083	10,273	96,356	92,551	11,045	103,596	81,066	9,674	90,740
2014	88,280	10,486	98,766	96,107	11,416	107,523	82,307	9,777	92,084
2015	90,492	10,701	101,194	99,755	11,797	111,552	83,531	9,878	93,409
2016	92,712	10,916	103,628	103,488	12,185	115,672	84,729	9,976	94,704
2017	94,942	11,131	106,073	107,310	12,581	119,890	85,903	10,071	95,974
2018	97,229	11,345	108,574	111,277	12,984	124,261	87,097	10,163	97,260
2019	99,519	11,559	111,078	115,330	13,395	128,725	88,261	10,251	98,512
2020	101,820	11,773	113,593	119,481	13,815	133,296	89,403	10,337	99,741
2021	104,131	11,988	116,119	123,729	14,244	137,974	90,522	10,421	100,944
2022	106,453	12,203	118,657	128,080	14,683	142,763	91,620	10,503	102,124
2023	108,786	12,420	121,206	132,534	15,131	147,664	92,697	10,583	103,280
2024	111,123	12,635	123,759	137,083	15,587	152,671	93,746	10,660	104,405
2025	113,471	12,852	126,323	141,741	16,054	157,794	94,774	10,734	105,509
2026	115,826	13,069	128,895	146,502	16,530	163,033	95,779	10,807	106,586
2027	118,193	13,287	131,481	151,377	17,018	168,395	96,764	10,878	107,642
2028	120,567	13,506	134,073	156,360	17,515	173,875	97,725	10,947	108,672
2029	122,947	13,724	136,671	161,451	18,022	179,473	98,662	11,013	109,675
2030	125,338	13,944	139,282	166,661	18,542	185,203	99,580	11,079	110,659

Year	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	2.37%	2.36%	2.37%	2.37%	2.36%	2.37%	2.37%	2.36%	2.37%
2009	2.59%	2.16%	2.54%	3.88%	3.44%	3.83%	1.57%	1.14%	1.52%
2010	2.67%	2.14%	2.62%	3.97%	3.42%	3.91%	1.65%	1.12%	1.60%
2011	2.76%	2.20%	2.70%	4.05%	3.49%	3.99%	1.74%	1.18%	1.68%
2012	2.67%	2.17%	2.61%	3.96%	3.45%	3.90%	1.65%	1.15%	1.59%
2013	2.61%	2.13%	2.56%	3.90%	3.42%	3.85%	1.59%	1.12%	1.54%
2014	2.55%	2.08%	2.50%	3.84%	3.36%	3.79%	1.53%	1.06%	1.48%
2015	2.51%	2.05%	2.46%	3.80%	3.33%	3.75%	1.49%	1.03%	1.44%
2016	2.45%	2.01%	2.41%	3.74%	3.29%	3.69%	1.43%	0.99%	1.39%
2017	2.41%	1.97%	2.36%	3.69%	3.25%	3.65%	1.39%	0.95%	1.34%
2018	2.41%	1.93%	2.36%	3.70%	3.21%	3.65%	1.39%	0.91%	1.34%
2019	2.35%	1.88%	2.31%	3.64%	3.16%	3.59%	1.34%	0.87%	1.29%
2020	2.31%	1.85%	2.26%	3.60%	3.14%	3.55%	1.29%	0.84%	1.25%
2021	2.27%	1.82%	2.22%	3.56%	3.10%	3.51%	1.25%	0.81%	1.21%
2022	2.23%	1.80%	2.19%	3.52%	3.08%	3.47%	1.21%	0.79%	1.17%
2023	2.19%	1.77%	2.15%	3.48%	3.05%	3.43%	1.17%	0.76%	1.13%
2024	2.15%	1.74%	2.11%	3.43%	3.02%	3.39%	1.13%	0.72%	1.09%
2025	2.11%	1.71%	2.07%	3.40%	2.99%	3.36%	1.10%	0.70%	1.06%
2026	2.08%	1.69%	2.04%	3.36%	2.97%	3.32%	1.06%	0.68%	1.02%
2027	2.04%	1.67%	2.01%	3.33%	2.95%	3.29%	1.03%	0.66%	0.99%
2028	2.01%	1.64%	1.97%	3.29%	2.92%	3.25%	0.99%	0.63%	0.96%
2029	1.97%	1.62%	1.94%	3.26%	2.90%	3.22%	0.96%	0.61%	0.92%
2030	1.94%	1.60%	1.91%	3.23%	2.88%	3.19%	0.93%	0.59%	0.90%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE GTN**

Annual Requirements									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	49,071,755	41,994	49,113,749	50,032,014	42,414	50,074,428	48,120,794	41,574	48,162,368
2009	50,446,874	43,191	50,490,065	52,083,042	44,153	52,127,195	48,975,123	42,312	49,017,435
2010	52,054,787	44,589	52,099,377	54,421,186	46,135	54,467,321	50,031,381	43,225	50,074,605
2011	53,852,175	46,152	53,898,326	57,010,121	48,329	57,058,450	51,242,407	44,271	51,286,678
2012	55,861,507	47,897	55,909,404	59,882,737	50,765	59,933,502	52,624,082	45,465	52,669,547
2013	57,973,363	49,733	58,023,096	62,929,897	53,348	62,983,245	54,068,801	46,713	54,115,514
2014	60,082,708	51,568	60,134,276	66,041,440	55,986	66,097,426	55,477,279	47,930	55,525,209
2015	62,199,566	53,412	62,252,977	69,229,637	58,688	69,288,325	56,859,271	49,124	56,908,395
2016	64,319,808	55,261	64,375,069	72,491,345	61,453	72,552,799	58,211,383	50,292	58,261,675
2017	66,435,170	57,107	66,492,277	75,818,635	64,274	75,882,909	59,526,549	51,428	59,577,977
2018	68,554,633	58,959	68,613,592	79,222,816	67,160	79,289,976	60,813,485	52,540	60,866,025
2019	70,671,692	60,811	70,732,503	82,697,798	70,106	82,767,904	62,066,833	53,623	62,120,456
2020	72,787,843	62,664	72,850,507	86,246,615	73,114	86,319,729	63,288,412	54,678	63,343,090
2021	74,904,903	64,520	74,969,423	89,872,707	76,188	89,948,896	64,480,328	55,708	64,536,036
2022	77,034,964	66,389	77,101,353	93,592,049	79,341	93,671,390	65,653,429	56,721	65,710,150
2023	79,169,773	68,265	79,238,037	97,396,543	82,566	97,479,110	66,800,836	57,713	66,858,549
2024	81,300,004	70,138	81,370,142	101,276,239	85,855	101,362,095	67,915,087	58,675	67,973,762
2025	83,434,500	72,017	83,506,517	105,243,468	89,218	105,332,686	69,004,107	59,616	69,063,723
2026	85,569,889	73,899	85,643,788	109,295,589	92,654	109,388,243	70,065,482	60,533	70,126,015
2027	87,709,882	75,786	87,785,668	113,438,937	96,166	113,535,104	71,102,648	61,429	71,164,077
2028	89,844,098	77,671	89,921,769	117,661,702	99,746	117,761,448	72,107,580	62,297	72,169,877
2029	91,886,476	79,478	91,965,954	121,850,922	103,297	121,954,220	73,012,528	63,079	73,075,607
2030	93,934,592	81,292	94,015,884	126,134,588	106,929	126,241,517	73,896,863	63,843	73,960,707

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	1.03%	5.36%	1.04%	1.99%	5.36%	1.99%	0.08%	5.36%	0.08%
2009	2.80%	2.85%	2.80%	4.10%	4.10%	4.10%	1.78%	1.78%	1.78%
2010	3.19%	3.24%	3.19%	4.49%	4.49%	4.49%	2.16%	2.16%	2.16%
2011	3.45%	3.50%	3.45%	4.76%	4.76%	4.76%	2.42%	2.42%	2.42%
2012	3.73%	3.78%	3.73%	5.04%	5.04%	5.04%	2.70%	2.70%	2.70%
2013	3.78%	3.83%	3.78%	5.09%	5.09%	5.09%	2.75%	2.75%	2.75%
2014	3.64%	3.69%	3.64%	4.94%	4.94%	4.94%	2.60%	2.60%	2.60%
2015	3.52%	3.58%	3.52%	4.83%	4.83%	4.83%	2.49%	2.49%	2.49%
2016	3.41%	3.46%	3.41%	4.71%	4.71%	4.71%	2.38%	2.38%	2.38%
2017	3.29%	3.34%	3.29%	4.59%	4.59%	4.59%	2.26%	2.26%	2.26%
2018	3.19%	3.24%	3.19%	4.49%	4.49%	4.49%	2.16%	2.16%	2.16%
2019	3.09%	3.14%	3.09%	4.39%	4.39%	4.39%	2.06%	2.06%	2.06%
2020	2.99%	3.05%	2.99%	4.29%	4.29%	4.29%	1.97%	1.97%	1.97%
2021	2.91%	2.96%	2.91%	4.20%	4.20%	4.20%	1.88%	1.88%	1.88%
2022	2.84%	2.90%	2.84%	4.14%	4.14%	4.14%	1.82%	1.82%	1.82%
2023	2.77%	2.82%	2.77%	4.06%	4.06%	4.06%	1.75%	1.75%	1.75%
2024	2.69%	2.74%	2.69%	3.98%	3.98%	3.98%	1.67%	1.67%	1.67%
2025	2.63%	2.68%	2.63%	3.92%	3.92%	3.92%	1.60%	1.60%	1.60%
2026	2.56%	2.61%	2.56%	3.85%	3.85%	3.85%	1.54%	1.54%	1.54%
2027	2.50%	2.55%	2.50%	3.79%	3.79%	3.79%	1.48%	1.48%	1.48%
2028	2.43%	2.49%	2.43%	3.72%	3.72%	3.72%	1.41%	1.41%	1.41%
2029	2.27%	2.33%	2.27%	3.56%	3.56%	3.56%	1.25%	1.25%	1.25%
2030	2.23%	2.28%	2.23%	3.52%	3.52%	3.52%	1.21%	1.21%	1.21%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE GTN**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	41,994	519,358	561,352	42,414	524,551	566,965	41,574	514,164	555,738
2009	43,191	531,617	574,809	44,153	546,055	590,208	42,312	523,293	565,605
2010	44,589	547,247	591,837	46,135	570,569	616,704	43,225	534,579	577,803
2011	46,152	565,786	611,937	48,329	597,712	646,042	44,271	547,518	591,789
2012	47,897	586,188	634,085	50,765	627,830	678,594	45,465	562,281	607,746
2013	49,733	608,672	658,405	53,348	659,777	713,125	46,713	577,718	624,431
2014	51,568	632,116	683,684	55,986	692,399	748,385	47,930	592,767	640,697
2015	53,412	655,576	708,988	58,688	725,825	784,514	49,124	607,534	656,657
2016	55,261	679,112	734,372	61,453	760,022	821,476	50,292	621,981	672,273
2017	57,107	702,597	759,705	64,274	794,906	859,181	51,428	636,033	687,461
2018	58,959	726,151	785,110	67,160	830,597	897,757	52,540	649,784	702,324
2019	60,811	749,697	810,508	70,106	867,030	937,136	53,623	663,176	716,798
2020	62,664	773,205	835,870	73,114	904,237	977,351	54,678	676,228	730,906
2021	64,520	796,741	861,262	76,188	942,254	1,018,442	55,708	688,964	744,671
2022	66,389	820,412	886,801	79,341	981,249	1,060,590	56,721	701,498	758,219
2023	68,265	844,150	912,415	82,566	1,021,136	1,103,702	57,713	713,758	771,471
2024	70,138	867,891	938,029	85,855	1,061,812	1,147,667	58,675	725,664	784,339
2025	72,017	891,658	963,675	89,218	1,103,406	1,192,624	59,616	737,300	796,916
2026	73,899	915,461	989,359	92,654	1,145,889	1,238,543	60,533	748,640	809,173
2027	75,786	939,296	1,015,082	96,166	1,189,330	1,285,496	61,429	759,722	821,151
2028	77,671	963,128	1,040,799	99,746	1,233,602	1,333,348	62,297	770,460	832,757
2029	79,478	986,805	1,066,283	103,297	1,277,524	1,380,821	63,079	780,129	843,208
2030	81,292	1,009,680	1,090,972	106,929	1,322,435	1,429,363	63,843	789,578	853,421

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	5.36%	2.04%	2.28%	5.36%	2.04%	2.28%	5.36%	2.04%	2.28%
2009	2.85%	2.36%	2.40%	4.10%	4.10%	4.10%	1.78%	1.78%	1.78%
2010	3.24%	2.94%	2.96%	4.49%	4.49%	4.49%	2.16%	2.16%	2.16%
2011	3.50%	3.39%	3.40%	4.76%	4.76%	4.76%	2.42%	2.42%	2.42%
2012	3.78%	3.61%	3.62%	5.04%	5.04%	5.04%	2.70%	2.70%	2.70%
2013	3.83%	3.84%	3.84%	5.09%	5.09%	5.09%	2.75%	2.75%	2.75%
2014	3.69%	3.85%	3.84%	4.94%	4.94%	4.94%	2.60%	2.60%	2.60%
2015	3.58%	3.71%	3.70%	4.83%	4.83%	4.83%	2.49%	2.49%	2.49%
2016	3.46%	3.59%	3.58%	4.71%	4.71%	4.71%	2.38%	2.38%	2.38%
2017	3.34%	3.46%	3.45%	4.59%	4.59%	4.59%	2.26%	2.26%	2.26%
2018	3.24%	3.35%	3.34%	4.49%	4.49%	4.49%	2.16%	2.16%	2.16%
2019	3.14%	3.24%	3.24%	4.39%	4.39%	4.39%	2.06%	2.06%	2.06%
2020	3.05%	3.14%	3.13%	4.29%	4.29%	4.29%	1.97%	1.97%	1.97%
2021	2.96%	3.04%	3.04%	4.20%	4.20%	4.20%	1.88%	1.88%	1.88%
2022	2.90%	2.97%	2.97%	4.14%	4.14%	4.14%	1.82%	1.82%	1.82%
2023	2.82%	2.89%	2.89%	4.06%	4.06%	4.06%	1.75%	1.75%	1.75%
2024	2.74%	2.81%	2.81%	3.98%	3.98%	3.98%	1.67%	1.67%	1.67%
2025	2.68%	2.74%	2.73%	3.92%	3.92%	3.92%	1.60%	1.60%	1.60%
2026	2.61%	2.67%	2.67%	3.85%	3.85%	3.85%	1.54%	1.54%	1.54%
2027	2.55%	2.60%	2.60%	3.79%	3.79%	3.79%	1.48%	1.48%	1.48%
2028	2.49%	2.54%	2.53%	3.72%	3.72%	3.72%	1.41%	1.41%	1.41%
2029	2.33%	2.46%	2.45%	3.56%	3.56%	3.56%	1.25%	1.25%	1.25%
2030	2.28%	2.32%	2.32%	3.52%	3.52%	3.52%	1.21%	1.21%	1.21%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE GTN**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	28,522,505	20,591,244	49,113,749	29,095,808	20,978,620	50,074,428	27,954,907	20,207,461	48,162,368
2009	29,636,348	20,853,717	50,490,065	30,612,311	21,514,884	52,127,195	28,757,567	20,259,868	49,017,435
2010	30,890,244	21,209,133	52,099,377	32,308,846	22,158,474	54,467,321	29,676,033	20,398,572	50,074,605
2011	32,232,262	21,666,065	53,898,326	34,136,545	22,921,905	57,058,450	30,657,189	20,629,489	51,286,678
2012	33,691,327	22,218,077	55,909,404	36,130,635	23,802,867	59,933,502	31,726,103	20,943,443	52,669,547
2013	35,208,749	22,814,347	58,023,096	38,232,856	24,750,389	62,983,245	32,825,115	21,290,399	54,115,514
2014	36,722,905	23,411,370	60,134,276	40,378,657	25,718,769	66,097,426	33,896,102	21,629,107	55,525,209
2015	38,237,072	24,015,906	62,252,977	42,572,401	26,715,925	69,288,325	34,942,534	21,965,860	56,908,395
2016	39,749,650	24,625,418	64,375,069	44,813,154	27,739,645	72,552,799	35,963,350	22,298,324	58,261,675
2017	41,260,660	25,231,617	66,492,277	47,101,751	28,781,158	75,882,909	36,958,987	22,618,990	59,577,977
2018	42,769,201	25,844,391	68,613,592	49,437,978	29,851,998	79,289,976	37,929,060	22,936,965	60,866,025
2019	44,274,625	26,457,878	70,732,503	51,821,876	30,946,027	82,767,904	38,873,433	23,247,023	62,120,456
2020	45,778,952	27,071,555	72,850,507	54,256,624	32,063,105	86,319,729	39,794,303	23,548,788	63,343,090
2021	47,281,769	27,687,655	74,969,423	56,742,611	33,206,285	89,948,896	40,691,699	23,844,337	64,536,036
2022	48,783,905	28,317,448	77,101,353	59,281,726	34,389,664	93,671,390	41,566,717	24,143,433	65,710,150
2023	50,285,152	28,952,886	79,238,037	61,874,646	35,604,464	97,479,110	42,419,543	24,439,006	66,858,549
2024	51,783,275	29,586,867	81,370,142	64,519,525	36,842,570	101,362,095	43,248,673	24,725,089	67,973,762
2025	53,280,046	30,226,471	83,506,517	67,219,444	38,113,242	105,332,686	44,055,985	25,007,738	69,063,723
2026	54,774,789	30,868,999	85,643,788	69,974,486	39,413,757	109,388,243	44,841,290	25,284,725	70,126,015
2027	56,269,424	31,516,244	87,785,668	72,788,062	40,747,041	113,535,104	45,606,517	25,557,560	71,164,077
2028	57,761,149	32,160,620	89,921,769	75,657,536	42,103,912	117,761,448	46,349,742	25,820,136	72,169,877
2029	59,191,748	32,774,206	91,965,954	78,506,609	43,447,611	121,954,220	47,025,099	26,050,509	73,075,607
2030	60,621,731	33,394,153	94,015,884	81,414,557	44,826,960	126,241,517	47,681,942	26,278,764	73,960,707

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	3.91%	1.27%	2.80%	5.21%	2.56%	4.10%	2.87%	0.26%	1.78%
2010	4.23%	1.70%	3.19%	5.54%	2.99%	4.49%	3.19%	0.68%	2.16%
2011	4.34%	2.15%	3.45%	5.66%	3.45%	4.76%	3.31%	1.13%	2.42%
2012	4.53%	2.55%	3.73%	5.84%	3.84%	5.04%	3.49%	1.52%	2.70%
2013	4.50%	2.68%	3.78%	5.82%	3.98%	5.09%	3.46%	1.66%	2.75%
2014	4.30%	2.62%	3.64%	5.61%	3.91%	4.94%	3.26%	1.59%	2.60%
2015	4.12%	2.58%	3.52%	5.43%	3.88%	4.83%	3.09%	1.56%	2.49%
2016	3.96%	2.54%	3.41%	5.26%	3.83%	4.71%	2.92%	1.51%	2.38%
2017	3.80%	2.46%	3.29%	5.11%	3.75%	4.59%	2.77%	1.44%	2.26%
2018	3.66%	2.43%	3.19%	4.96%	3.72%	4.49%	2.62%	1.41%	2.16%
2019	3.52%	2.37%	3.09%	4.82%	3.66%	4.39%	2.49%	1.35%	2.06%
2020	3.40%	2.32%	2.99%	4.70%	3.61%	4.29%	2.37%	1.30%	1.97%
2021	3.28%	2.28%	2.91%	4.58%	3.57%	4.20%	2.26%	1.26%	1.88%
2022	3.18%	2.27%	2.84%	4.47%	3.56%	4.14%	2.15%	1.25%	1.82%
2023	3.08%	2.24%	2.77%	4.37%	3.53%	4.06%	2.05%	1.22%	1.75%
2024	2.98%	2.19%	2.69%	4.27%	3.48%	3.98%	1.95%	1.17%	1.67%
2025	2.89%	2.16%	2.63%	4.18%	3.45%	3.92%	1.87%	1.14%	1.60%
2026	2.81%	2.13%	2.56%	4.10%	3.41%	3.85%	1.78%	1.11%	1.54%
2027	2.73%	2.10%	2.50%	4.02%	3.38%	3.79%	1.71%	1.08%	1.48%
2028	2.65%	2.04%	2.43%	3.94%	3.33%	3.72%	1.63%	1.03%	1.41%
2029	2.48%	1.91%	2.27%	3.77%	3.19%	3.56%	1.46%	0.89%	1.25%
2030	2.42%	1.89%	2.23%	3.70%	3.17%	3.52%	1.40%	0.88%	1.21%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE GTN

Year	Customer Forecast								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	38,137	5,902	44,039	38,518	5,961	44,480	37,756	5,843	43,599
2009	39,821	6,028	45,849	40,725	6,164	46,890	39,031	5,908	44,939
2010	41,716	6,182	47,898	43,200	6,402	49,601	40,481	5,999	46,480
2011	43,745	6,355	50,100	45,870	6,664	52,534	42,027	6,106	48,133
2012	45,950	6,556	52,506	48,789	6,961	55,750	43,707	6,236	49,943
2013	48,246	6,770	55,015	51,871	7,279	59,149	45,434	6,375	51,809
2014	50,539	6,983	57,522	55,020	7,602	62,623	47,120	6,511	53,631
2015	52,836	7,198	60,034	58,244	7,935	66,179	48,771	6,644	55,415
2016	55,133	7,413	62,546	61,541	8,274	69,815	50,385	6,775	57,160
2017	57,431	7,628	65,059	64,912	8,622	73,534	51,963	6,902	58,865
2018	59,729	7,843	67,572	68,358	8,976	77,335	53,504	7,026	60,530
2019	62,024	8,058	70,082	71,879	9,338	81,217	55,008	7,146	62,154
2020	64,322	8,273	72,595	75,478	9,708	85,187	56,478	7,264	63,742
2021	66,620	8,490	75,109	79,158	10,087	89,246	57,913	7,380	65,293
2022	68,920	8,707	77,626	82,921	10,476	93,397	59,317	7,494	66,810
2023	71,221	8,925	80,146	86,768	10,873	97,641	60,688	7,605	68,293
2024	73,521	9,143	82,664	90,697	11,279	101,976	62,024	7,713	69,737
2025	75,822	9,361	85,184	94,712	11,694	106,406	63,329	7,819	71,148
2026	78,123	9,580	87,704	98,814	12,118	110,932	64,602	7,922	72,524
2027	80,427	9,801	90,228	103,008	12,552	115,560	65,845	8,024	73,869
2028	82,730	10,021	92,751	107,289	12,996	120,285	67,056	8,122	75,178
2029	84,943	10,231	95,174	111,546	13,435	124,981	68,165	8,210	76,375
2030	87,159	10,442	97,601	115,895	13,885	129,779	69,247	8,296	77,543

Year	Annual Growth Rates								
	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	3.67%	2.45%	3.50%	3.67%	2.45%	3.50%	3.67%	2.45%	3.50%
2009	4.42%	2.13%	4.11%	5.73%	3.41%	5.42%	3.38%	1.11%	3.07%
2010	4.76%	2.56%	4.47%	6.08%	3.85%	5.78%	3.72%	1.54%	3.43%
2011	4.86%	2.81%	4.60%	6.18%	4.10%	5.91%	3.82%	1.79%	3.56%
2012	5.04%	3.16%	4.80%	6.36%	4.45%	6.12%	4.00%	2.13%	3.76%
2013	5.00%	3.27%	4.78%	6.32%	4.56%	6.10%	3.95%	2.24%	3.74%
2014	4.75%	3.15%	4.56%	6.07%	4.45%	5.87%	3.71%	2.12%	3.52%
2015	4.54%	3.08%	4.37%	5.86%	4.37%	5.68%	3.50%	2.05%	3.33%
2016	4.35%	2.98%	4.18%	5.66%	4.28%	5.50%	3.31%	1.96%	3.15%
2017	4.17%	2.90%	4.02%	5.48%	4.20%	5.33%	3.13%	1.88%	2.98%
2018	4.00%	2.82%	3.86%	5.31%	4.11%	5.17%	2.97%	1.80%	2.83%
2019	3.84%	2.74%	3.72%	5.15%	4.03%	5.02%	2.81%	1.71%	2.68%
2020	3.70%	2.67%	3.59%	5.01%	3.97%	4.89%	2.67%	1.65%	2.55%
2021	3.57%	2.61%	3.46%	4.88%	3.90%	4.76%	2.54%	1.59%	2.43%
2022	3.45%	2.56%	3.35%	4.75%	3.85%	4.65%	2.42%	1.54%	2.32%
2023	3.34%	2.51%	3.25%	4.64%	3.79%	4.54%	2.31%	1.49%	2.22%
2024	3.23%	2.44%	3.14%	4.53%	3.73%	4.44%	2.20%	1.42%	2.12%
2025	3.13%	2.39%	3.05%	4.43%	3.68%	4.34%	2.10%	1.37%	2.02%
2026	3.03%	2.34%	2.96%	4.33%	3.63%	4.25%	2.01%	1.32%	1.93%
2027	2.95%	2.30%	2.88%	4.24%	3.58%	4.17%	1.92%	1.28%	1.85%
2028	2.86%	2.25%	2.80%	4.16%	3.53%	4.09%	1.84%	1.23%	1.77%
2029	2.68%	2.09%	2.61%	3.97%	3.38%	3.90%	1.65%	1.08%	1.59%
2030	2.61%	2.06%	2.55%	3.90%	3.35%	3.84%	1.59%	1.05%	1.53%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE ME-OR**

Annual Requirements									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	13,448,244	9,097	13,457,341	13,708,867	9,188	13,718,055	13,190,119	9,006	13,199,125
2009	13,423,038	9,027	13,432,065	13,856,618	9,287	13,865,905	13,033,018	8,899	13,041,917
2010	13,437,586	8,999	13,446,585	14,047,138	9,415	14,056,553	12,916,294	8,819	12,925,114
2011	13,485,640	9,005	13,494,645	14,275,380	9,568	14,284,948	12,832,828	8,762	12,841,590
2012	13,603,986	9,082	13,613,068	14,581,799	9,773	14,591,572	12,816,627	8,751	12,825,378
2013	13,731,810	9,168	13,740,978	14,903,857	9,989	14,913,846	12,808,412	8,746	12,817,157
2014	13,844,532	9,241	13,853,773	15,215,258	10,198	15,225,456	12,785,011	8,730	12,793,741
2015	13,966,384	9,332	13,975,717	15,542,213	10,417	15,552,630	12,769,250	8,719	12,777,969
2016	14,030,207	9,380	14,039,587	15,810,200	10,597	15,820,796	12,699,506	8,671	12,708,178
2017	14,097,858	9,432	14,107,290	16,086,795	10,782	16,097,577	12,633,353	8,626	12,641,979
2018	14,189,682	9,502	14,199,184	16,395,511	10,989	16,406,500	12,588,918	8,596	12,597,514
2019	14,252,802	9,551	14,262,352	16,676,174	11,177	16,687,351	12,518,663	8,548	12,527,211
2020	14,335,876	9,615	14,345,491	16,984,720	11,384	16,996,103	12,466,084	8,512	12,474,595
2021	14,373,181	9,645	14,382,826	17,243,994	11,558	17,255,552	12,373,525	8,449	12,381,974
2022	14,449,887	9,705	14,459,592	17,554,513	11,766	17,566,279	12,315,490	8,409	12,323,899
2023	14,535,278	9,772	14,545,049	17,880,692	11,984	17,892,676	12,264,789	8,374	12,273,164
2024	14,614,201	9,834	14,624,035	18,204,317	12,201	18,216,518	12,208,424	8,336	12,216,760
2025	14,701,186	9,903	14,711,089	18,543,320	12,428	18,555,749	12,158,705	8,302	12,167,007
2026	14,791,761	9,975	14,801,736	18,892,511	12,662	18,905,173	12,111,736	8,270	12,120,006
2027	14,884,690	10,049	14,894,739	19,250,560	12,902	19,263,462	12,066,432	8,239	12,074,671
2028	14,966,874	10,115	14,976,989	19,600,689	13,137	19,613,826	12,012,121	8,202	12,020,323
2029	15,051,525	10,183	15,061,709	19,959,819	13,378	19,973,196	11,959,679	8,166	11,967,845
2030	15,141,650	10,256	15,151,906	20,332,152	13,627	20,345,780	11,911,444	8,133	11,919,577

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	-1.94%	-1.49%	-1.94%	-1.03%	-1.49%	-1.03%	-2.85%	-1.49%	-2.85%
2009	-0.19%	-0.77%	-0.19%	1.08%	1.08%	1.08%	-1.19%	-1.19%	-1.19%
2010	0.11%	-0.31%	0.11%	1.37%	1.37%	1.37%	-0.90%	-0.90%	-0.90%
2011	0.36%	0.06%	0.36%	1.62%	1.62%	1.62%	-0.65%	-0.65%	-0.65%
2012	0.88%	0.85%	0.88%	2.15%	2.15%	2.15%	-0.13%	-0.13%	-0.13%
2013	0.94%	0.95%	0.94%	2.21%	2.21%	2.21%	-0.06%	-0.06%	-0.06%
2014	0.82%	0.79%	0.82%	2.09%	2.09%	2.09%	-0.18%	-0.18%	-0.18%
2015	0.88%	0.99%	0.88%	2.15%	2.15%	2.15%	-0.12%	-0.12%	-0.12%
2016	0.46%	0.52%	0.46%	1.72%	1.72%	1.72%	-0.55%	-0.55%	-0.55%
2017	0.48%	0.55%	0.48%	1.75%	1.75%	1.75%	-0.52%	-0.52%	-0.52%
2018	0.65%	0.74%	0.65%	1.92%	1.92%	1.92%	-0.35%	-0.35%	-0.35%
2019	0.44%	0.51%	0.44%	1.71%	1.71%	1.71%	-0.56%	-0.56%	-0.56%
2020	0.58%	0.67%	0.58%	1.85%	1.85%	1.85%	-0.42%	-0.42%	-0.42%
2021	0.26%	0.31%	0.26%	1.53%	1.53%	1.53%	-0.74%	-0.74%	-0.74%
2022	0.53%	0.62%	0.53%	1.80%	1.80%	1.80%	-0.47%	-0.47%	-0.47%
2023	0.59%	0.69%	0.59%	1.86%	1.86%	1.86%	-0.41%	-0.41%	-0.41%
2024	0.54%	0.64%	0.54%	1.81%	1.81%	1.81%	-0.46%	-0.46%	-0.46%
2025	0.60%	0.70%	0.60%	1.86%	1.86%	1.86%	-0.41%	-0.41%	-0.41%
2026	0.62%	0.73%	0.62%	1.88%	1.88%	1.88%	-0.39%	-0.39%	-0.39%
2027	0.63%	0.74%	0.63%	1.90%	1.90%	1.90%	-0.37%	-0.37%	-0.37%
2028	0.55%	0.66%	0.55%	1.82%	1.82%	1.82%	-0.45%	-0.45%	-0.45%
2029	0.57%	0.68%	0.57%	1.83%	1.83%	1.83%	-0.44%	-0.44%	-0.44%
2030	0.60%	0.72%	0.60%	1.87%	1.87%	1.87%	-0.40%	-0.40%	-0.40%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE ME-OR**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	9,097	192,224	201,321	9,188	194,146	203,334	9,006	190,302	199,308
2009	9,027	190,959	199,987	9,287	196,239	205,526	8,899	188,035	196,934
2010	8,999	190,589	199,589	9,415	198,937	208,352	8,819	186,351	195,170
2011	9,005	190,845	199,850	9,568	202,169	211,737	8,762	185,147	193,909
2012	9,082	192,511	201,593	9,773	206,509	216,282	8,751	184,913	193,664
2013	9,168	194,372	203,540	9,989	211,070	221,059	8,746	184,795	193,540
2014	9,241	195,953	205,193	10,198	215,480	225,678	8,730	184,457	193,187
2015	9,332	197,869	207,202	10,417	220,110	230,527	8,719	184,230	192,949
2016	9,380	198,892	208,273	10,597	223,906	234,502	8,671	183,223	191,895
2017	9,432	199,975	209,407	10,782	227,823	238,605	8,626	182,269	190,895
2018	9,502	201,444	210,946	10,989	232,195	243,184	8,596	181,628	190,224
2019	9,551	202,473	212,024	11,177	236,170	247,346	8,548	180,614	189,162
2020	9,615	203,812	213,427	11,384	240,539	251,923	8,512	179,856	188,368
2021	9,645	204,448	214,093	11,558	244,211	255,769	8,449	178,520	186,969
2022	9,705	205,699	215,404	11,766	248,609	260,374	8,409	177,683	186,092
2023	9,772	207,093	216,865	11,984	253,228	265,212	8,374	176,952	185,326
2024	9,834	208,392	218,226	12,201	257,811	270,012	8,336	176,138	184,474
2025	9,903	209,822	219,725	12,428	262,612	275,041	8,302	175,421	183,723
2026	9,975	211,310	221,285	12,662	267,558	280,220	8,270	174,743	183,013
2027	10,049	212,843	222,892	12,902	272,628	285,531	8,239	174,090	182,329
2028	10,115	214,211	224,326	13,137	277,587	290,724	8,202	173,306	181,508
2029	10,183	215,623	225,807	13,378	282,673	296,051	8,166	172,549	180,716
2030	10,256	217,127	227,383	13,627	287,946	301,573	8,133	171,854	179,987

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	-1.49%	0.02%	-0.05%	-1.49%	0.02%	-0.05%	-1.49%	0.02%	-0.05%
2009	-0.77%	-0.66%	-0.66%	1.08%	1.08%	1.08%	-1.19%	-1.19%	-1.19%
2010	-0.31%	-0.19%	-0.20%	1.37%	1.37%	1.37%	-0.90%	-0.90%	-0.90%
2011	0.06%	0.13%	0.13%	1.62%	1.62%	1.62%	-0.65%	-0.65%	-0.65%
2012	0.85%	0.87%	0.87%	2.15%	2.15%	2.15%	-0.13%	-0.13%	-0.13%
2013	0.95%	0.97%	0.97%	2.21%	2.21%	2.21%	-0.06%	-0.06%	-0.06%
2014	0.79%	0.81%	0.81%	2.09%	2.09%	2.09%	-0.18%	-0.18%	-0.18%
2015	0.99%	0.98%	0.98%	2.15%	2.15%	2.15%	-0.12%	-0.12%	-0.12%
2016	0.52%	0.52%	0.52%	1.72%	1.72%	1.72%	-0.55%	-0.55%	-0.55%
2017	0.55%	0.54%	0.54%	1.75%	1.75%	1.75%	-0.52%	-0.52%	-0.52%
2018	0.74%	0.73%	0.73%	1.92%	1.92%	1.92%	-0.35%	-0.35%	-0.35%
2019	0.51%	0.51%	0.51%	1.71%	1.71%	1.71%	-0.56%	-0.56%	-0.56%
2020	0.67%	0.66%	0.66%	1.85%	1.85%	1.85%	-0.42%	-0.42%	-0.42%
2021	0.31%	0.31%	0.31%	1.53%	1.53%	1.53%	-0.74%	-0.74%	-0.74%
2022	0.62%	0.61%	0.61%	1.80%	1.80%	1.80%	-0.47%	-0.47%	-0.47%
2023	0.69%	0.68%	0.68%	1.86%	1.86%	1.86%	-0.41%	-0.41%	-0.41%
2024	0.64%	0.63%	0.63%	1.81%	1.81%	1.81%	-0.46%	-0.46%	-0.46%
2025	0.70%	0.69%	0.69%	1.86%	1.86%	1.86%	-0.41%	-0.41%	-0.41%
2026	0.73%	0.71%	0.71%	1.88%	1.88%	1.88%	-0.39%	-0.39%	-0.39%
2027	0.74%	0.73%	0.73%	1.90%	1.90%	1.90%	-0.37%	-0.37%	-0.37%
2028	0.66%	0.64%	0.64%	1.82%	1.82%	1.82%	-0.45%	-0.45%	-0.45%
2029	0.68%	0.66%	0.66%	1.83%	1.83%	1.83%	-0.44%	-0.44%	-0.44%
2030	0.72%	0.70%	0.70%	1.87%	1.87%	1.87%	-0.40%	-0.40%	-0.40%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE ME-WA**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	6,102,116	7,355,225	13,457,341	6,224,768	7,493,286	13,718,055	5,980,684	7,218,441	13,199,125
2009	6,178,963	7,253,103	13,432,065	6,382,444	7,483,461	13,865,905	5,995,743	7,046,174	13,041,917
2010	6,255,237	7,191,348	13,446,585	6,542,502	7,514,051	14,056,553	6,009,360	6,915,753	12,925,114
2011	6,333,333	7,161,312	13,494,645	6,707,506	7,577,441	14,284,948	6,023,846	6,817,744	12,841,590
2012	6,411,261	7,201,806	13,613,068	6,875,447	7,716,125	14,591,572	6,037,291	6,788,087	12,825,378
2013	6,488,907	7,252,071	13,740,978	7,046,245	7,867,601	14,913,846	6,049,608	6,767,549	12,817,157
2014	6,566,132	7,287,641	13,853,773	7,219,788	8,005,668	15,225,456	6,060,693	6,733,048	12,793,741
2015	6,643,233	7,332,484	13,975,717	7,396,444	8,156,186	15,552,630	6,070,847	6,707,123	12,777,969
2016	6,719,927	7,319,660	14,039,587	7,575,944	8,244,852	15,820,796	6,079,829	6,628,348	12,708,178
2017	6,796,387	7,310,902	14,107,290	7,758,522	8,339,055	16,097,577	6,087,823	6,554,156	12,641,979
2018	6,872,520	7,326,664	14,199,184	7,944,116	8,462,384	16,406,500	6,094,765	6,502,749	12,597,514
2019	6,948,236	7,314,117	14,262,352	8,132,663	8,554,688	16,687,351	6,100,600	6,426,611	12,527,211
2020	7,023,770	7,321,721	14,345,491	8,324,482	8,671,622	16,996,103	6,105,558	6,369,038	12,474,595
2021	7,098,953	7,283,873	14,382,826	8,519,417	8,736,135	17,255,552	6,109,510	6,272,464	12,381,974
2022	7,173,942	7,285,650	14,459,592	8,717,704	8,848,575	17,566,279	6,112,615	6,211,285	12,323,899
2023	7,248,638	7,296,412	14,545,049	8,919,271	8,973,405	17,892,676	6,114,805	6,158,359	12,273,164
2024	7,323,041	7,300,993	14,624,035	9,124,165	9,092,353	18,216,518	6,116,103	6,100,657	12,216,760
2025	7,397,125	7,313,964	14,711,089	9,332,398	9,223,350	18,555,749	6,116,504	6,050,502	12,167,007
2026	7,470,974	7,330,762	14,801,736	9,544,128	9,361,046	18,905,173	6,116,101	6,003,906	12,120,006
2027	7,544,509	7,350,230	14,894,739	9,759,300	9,504,163	19,263,462	6,114,844	5,959,826	12,074,671
2028	7,617,795	7,359,194	14,976,989	9,978,049	9,635,777	19,613,826	6,112,808	5,907,515	12,020,323
2029	7,690,812	7,370,897	15,061,709	10,200,401	9,772,795	19,973,196	6,109,994	5,857,851	11,967,845
2030	7,763,515	7,388,391	15,151,906	10,426,345	9,919,434	20,345,780	6,106,382	5,813,195	11,919,577

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	1.26%	-1.39%	-0.19%	2.53%	-0.13%	1.08%	0.25%	-2.39%	-1.19%
2010	1.23%	-0.85%	0.11%	2.51%	0.41%	1.37%	0.23%	-1.85%	-0.90%
2011	1.25%	-0.42%	0.36%	2.52%	0.84%	1.62%	0.24%	-1.42%	-0.65%
2012	1.23%	0.57%	0.88%	2.50%	1.83%	2.15%	0.22%	-0.43%	-0.13%
2013	1.21%	0.70%	0.94%	2.48%	1.96%	2.21%	0.20%	-0.30%	-0.06%
2014	1.19%	0.49%	0.82%	2.46%	1.75%	2.09%	0.18%	-0.51%	-0.18%
2015	1.17%	0.62%	0.88%	2.45%	1.88%	2.15%	0.17%	-0.39%	-0.12%
2016	1.15%	-0.17%	0.46%	2.43%	1.09%	1.72%	0.15%	-1.17%	-0.55%
2017	1.14%	-0.12%	0.48%	2.41%	1.14%	1.75%	0.13%	-1.12%	-0.52%
2018	1.12%	0.22%	0.65%	2.39%	1.48%	1.92%	0.11%	-0.78%	-0.35%
2019	1.10%	-0.17%	0.44%	2.37%	1.09%	1.71%	0.10%	-1.17%	-0.56%
2020	1.09%	0.10%	0.58%	2.36%	1.37%	1.85%	0.08%	-0.90%	-0.42%
2021	1.07%	-0.52%	0.26%	2.34%	0.74%	1.53%	0.06%	-1.52%	-0.74%
2022	1.06%	0.02%	0.53%	2.33%	1.29%	1.80%	0.05%	-0.98%	-0.47%
2023	1.04%	0.15%	0.59%	2.31%	1.41%	1.86%	0.04%	-0.85%	-0.41%
2024	1.03%	0.06%	0.54%	2.30%	1.33%	1.81%	0.02%	-0.94%	-0.46%
2025	1.01%	0.18%	0.60%	2.28%	1.44%	1.86%	0.01%	-0.82%	-0.41%
2026	1.00%	0.23%	0.62%	2.27%	1.49%	1.88%	-0.01%	-0.77%	-0.39%
2027	0.98%	0.27%	0.63%	2.25%	1.53%	1.90%	-0.02%	-0.73%	-0.37%
2028	0.97%	0.12%	0.55%	2.24%	1.38%	1.82%	-0.03%	-0.88%	-0.45%
2029	0.96%	0.16%	0.57%	2.23%	1.42%	1.83%	-0.05%	-0.84%	-0.44%
2030	0.95%	0.24%	0.60%	2.22%	1.50%	1.87%	-0.06%	-0.76%	-0.40%

Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE ME-OR

Customer Forecast									
Year	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	10,221	1,794	12,015	10,324	1,811	12,135	10,119	1,776	11,895
2009	10,381	1,807	12,188	10,617	1,848	12,465	10,175	1,771	11,946
2010	10,541	1,821	12,362	10,916	1,886	12,802	10,229	1,768	11,996
2011	10,704	1,835	12,539	11,224	1,924	13,149	10,284	1,763	12,047
2012	10,868	1,849	12,716	11,539	1,963	13,502	10,337	1,759	12,096
2013	11,031	1,862	12,893	11,860	2,002	13,862	10,388	1,754	12,142
2014	11,194	1,876	13,070	12,186	2,042	14,229	10,437	1,749	12,186
2015	11,357	1,890	13,247	12,520	2,083	14,603	10,484	1,744	12,228
2016	11,520	1,903	13,424	12,859	2,125	14,984	10,528	1,740	12,268
2017	11,683	1,917	13,600	13,205	2,167	15,372	10,571	1,735	12,305
2018	11,846	1,931	13,777	13,558	2,210	15,767	10,612	1,730	12,341
2019	12,008	1,945	13,953	13,916	2,253	16,170	10,650	1,725	12,375
2020	12,171	1,958	14,129	14,282	2,298	16,580	10,687	1,719	12,406
2021	12,333	1,972	14,305	14,655	2,343	16,998	10,722	1,714	12,436
2022	12,496	1,986	14,482	15,035	2,389	17,424	10,755	1,709	12,464
2023	12,658	2,000	14,658	15,421	2,436	17,857	10,786	1,704	12,490
2024	12,821	2,013	14,834	15,816	2,484	18,299	10,816	1,698	12,514
2025	12,983	2,027	15,010	16,217	2,532	18,749	10,843	1,693	12,537
2026	13,145	2,041	15,186	16,626	2,581	19,207	10,870	1,688	12,557
2027	13,307	2,055	15,361	17,043	2,632	19,674	10,894	1,682	12,576
2028	13,469	2,069	15,537	17,467	2,683	20,150	10,917	1,677	12,593
2029	13,630	2,082	15,713	17,899	2,735	20,634	10,938	1,671	12,609
2030	13,792	2,096	15,888	18,339	2,787	21,127	10,958	1,665	12,623

Annual Growth Rates									
Year	Medium Forecast			High Forecast			Low Forecast		
	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	1.56%	0.48%	1.40%	1.56%	0.48%	1.40%	1.56%	0.48%	1.40%
2009	1.57%	0.75%	1.44%	2.84%	2.01%	2.72%	0.56%	-0.26%	0.43%
2010	1.54%	0.81%	1.43%	2.81%	2.07%	2.70%	0.53%	-0.20%	0.42%
2011	1.55%	0.75%	1.43%	2.83%	2.02%	2.71%	0.54%	-0.25%	0.42%
2012	1.53%	0.75%	1.41%	2.80%	2.01%	2.69%	0.52%	-0.26%	0.40%
2013	1.50%	0.74%	1.39%	2.78%	2.01%	2.67%	0.49%	-0.26%	0.38%
2014	1.48%	0.73%	1.37%	2.75%	2.00%	2.65%	0.47%	-0.27%	0.36%
2015	1.46%	0.73%	1.35%	2.73%	2.00%	2.63%	0.45%	-0.27%	0.35%
2016	1.43%	0.72%	1.33%	2.71%	1.99%	2.61%	0.43%	-0.28%	0.33%
2017	1.41%	0.72%	1.32%	2.69%	1.99%	2.59%	0.41%	-0.28%	0.31%
2018	1.39%	0.72%	1.30%	2.67%	1.98%	2.57%	0.38%	-0.29%	0.29%
2019	1.37%	0.71%	1.28%	2.65%	1.98%	2.55%	0.36%	-0.29%	0.27%
2020	1.35%	0.71%	1.26%	2.63%	1.97%	2.54%	0.35%	-0.30%	0.26%
2021	1.33%	0.70%	1.25%	2.61%	1.97%	2.52%	0.33%	-0.30%	0.24%
2022	1.32%	0.70%	1.23%	2.59%	1.96%	2.51%	0.31%	-0.30%	0.22%
2023	1.30%	0.69%	1.22%	2.57%	1.96%	2.49%	0.29%	-0.31%	0.21%
2024	1.28%	0.69%	1.20%	2.56%	1.96%	2.47%	0.27%	-0.31%	0.19%
2025	1.26%	0.68%	1.19%	2.54%	1.95%	2.46%	0.26%	-0.32%	0.18%
2026	1.25%	0.68%	1.17%	2.52%	1.95%	2.44%	0.24%	-0.32%	0.17%
2027	1.23%	0.68%	1.16%	2.51%	1.94%	2.43%	0.22%	-0.33%	0.15%
2028	1.22%	0.67%	1.14%	2.49%	1.94%	2.42%	0.21%	-0.33%	0.14%
2029	1.20%	0.67%	1.13%	2.47%	1.94%	2.40%	0.19%	-0.33%	0.12%
2030	1.19%	0.66%	1.12%	2.46%	1.93%	2.39%	0.18%	-0.34%	0.11%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Requirements and Growth Rates
ZONE ME-WA**

Annual Requirements									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms	Heating Therms	Baseload Therms	Total Therms
2008	11,243,947	7,985	11,251,932	11,467,859	8,065	11,475,924	11,022,242	7,906	11,030,147
2009	11,341,617	8,058	11,349,675	11,713,053	8,238	11,721,291	11,007,292	7,895	11,015,187
2010	11,451,575	8,138	11,459,713	11,975,447	8,422	11,983,869	11,003,357	7,892	11,011,249
2011	11,588,413	8,237	11,596,650	12,271,037	8,630	12,279,668	11,023,994	7,907	11,031,901
2012	11,729,264	8,340	11,737,605	12,576,461	8,845	12,585,306	11,046,924	7,923	11,054,847
2013	11,869,526	8,444	11,877,970	12,886,986	9,063	12,896,050	11,067,757	7,938	11,075,695
2014	12,008,955	8,547	12,017,502	13,202,421	9,285	13,211,706	11,086,311	7,952	11,094,263
2015	12,147,949	8,650	12,156,599	13,523,266	9,511	13,532,777	11,103,006	7,964	11,110,969
2016	12,286,581	8,754	12,295,335	13,849,684	9,740	13,859,424	11,117,946	7,974	11,125,920
2017	12,423,722	8,857	12,432,579	14,180,481	9,973	14,190,454	11,130,146	7,983	11,138,129
2018	12,560,853	8,961	12,569,814	14,517,391	10,210	14,527,601	11,141,000	7,991	11,148,991
2019	12,697,281	9,065	12,706,345	14,859,712	10,451	14,870,163	11,149,919	7,997	11,157,916
2020	12,832,707	9,168	12,841,875	15,207,165	10,695	15,217,860	11,156,683	8,002	11,164,685
2021	12,967,459	9,271	12,976,730	15,560,200	10,943	15,571,144	11,161,629	8,006	11,169,634
2022	13,102,745	9,376	13,112,121	15,920,347	11,197	15,931,544	11,165,837	8,009	11,173,846
2023	13,237,691	9,480	13,247,171	16,286,670	11,454	16,298,124	11,168,572	8,011	11,176,582
2024	13,371,767	9,585	13,381,352	16,658,610	11,716	16,670,326	11,169,419	8,011	11,177,430
2025	13,505,519	9,690	13,515,209	17,036,918	11,982	17,048,900	11,168,878	8,011	11,176,889
2026	13,638,784	9,795	13,648,579	17,421,486	12,252	17,433,738	11,166,845	8,009	11,174,854
2027	13,771,545	9,900	13,781,445	17,812,379	12,527	17,824,906	11,163,339	8,007	11,171,346
2028	13,903,227	10,005	13,913,233	18,208,943	12,806	18,221,749	11,157,929	8,003	11,165,932
2029	14,034,372	10,110	14,044,482	18,611,951	13,090	18,625,041	11,151,094	7,998	11,159,092
2030	14,165,150	10,215	14,175,365	19,021,723	13,378	19,035,101	11,143,005	7,992	11,150,997

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	2.03%	5.96%	2.03%	3.03%	5.96%	3.03%	1.03%	5.96%	1.03%
2009	0.87%	0.90%	0.87%	2.14%	2.14%	2.14%	-0.14%	-0.14%	-0.14%
2010	0.97%	1.00%	0.97%	2.24%	2.24%	2.24%	-0.04%	-0.04%	-0.04%
2011	1.19%	1.21%	1.19%	2.47%	2.47%	2.47%	0.19%	0.19%	0.19%
2012	1.22%	1.25%	1.22%	2.49%	2.49%	2.49%	0.21%	0.21%	0.21%
2013	1.20%	1.24%	1.20%	2.47%	2.47%	2.47%	0.19%	0.19%	0.19%
2014	1.17%	1.22%	1.17%	2.45%	2.45%	2.45%	0.17%	0.17%	0.17%
2015	1.16%	1.21%	1.16%	2.43%	2.43%	2.43%	0.15%	0.15%	0.15%
2016	1.14%	1.20%	1.14%	2.41%	2.41%	2.41%	0.13%	0.13%	0.13%
2017	1.12%	1.18%	1.12%	2.39%	2.39%	2.39%	0.11%	0.11%	0.11%
2018	1.10%	1.17%	1.10%	2.38%	2.38%	2.38%	0.10%	0.10%	0.10%
2019	1.09%	1.16%	1.09%	2.36%	2.36%	2.36%	0.08%	0.08%	0.08%
2020	1.07%	1.14%	1.07%	2.34%	2.34%	2.34%	0.06%	0.06%	0.06%
2021	1.05%	1.13%	1.05%	2.32%	2.32%	2.32%	0.04%	0.04%	0.04%
2022	1.04%	1.13%	1.04%	2.31%	2.31%	2.31%	0.04%	0.04%	0.04%
2023	1.03%	1.12%	1.03%	2.30%	2.30%	2.30%	0.02%	0.02%	0.02%
2024	1.01%	1.10%	1.01%	2.28%	2.28%	2.28%	0.01%	0.01%	0.01%
2025	1.00%	1.09%	1.00%	2.27%	2.27%	2.27%	0.00%	0.00%	0.00%
2026	0.99%	1.08%	0.99%	2.26%	2.26%	2.26%	-0.02%	-0.02%	-0.02%
2027	0.97%	1.07%	0.97%	2.24%	2.24%	2.24%	-0.03%	-0.03%	-0.03%
2028	0.96%	1.06%	0.96%	2.23%	2.23%	2.23%	-0.05%	-0.05%	-0.05%
2029	0.94%	1.05%	0.94%	2.21%	2.21%	2.21%	-0.06%	-0.06%	-0.06%
2030	0.93%	1.04%	0.93%	2.20%	2.20%	2.20%	-0.07%	-0.07%	-0.07%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Daily Requirements and Growth Rates
ZONE ME-WA**

Peak Day - Baseload									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms	Daily Baseload	Peak-Day Therms	Peak-Day Therms
2008	7,985	150,512	158,497	8,065	152,017	160,082	7,906	149,006	156,912
2009	8,058	151,663	159,720	8,238	155,267	163,505	7,895	148,804	156,699
2010	8,138	153,049	161,187	8,422	158,745	167,168	7,892	148,751	156,643
2011	8,237	154,573	162,810	8,630	162,664	171,294	7,907	149,030	156,937
2012	8,340	156,523	164,864	8,845	166,712	175,557	7,923	149,340	157,263
2013	8,444	158,484	166,928	9,063	170,829	179,892	7,938	149,622	157,560
2014	8,547	160,439	168,986	9,285	175,010	184,295	7,952	149,873	157,824
2015	8,650	162,397	171,047	9,511	179,263	188,774	7,964	150,098	158,062
2016	8,754	164,357	173,112	9,740	183,590	193,330	7,974	150,300	158,275
2017	8,857	166,301	175,158	9,973	187,975	197,948	7,983	150,465	158,448
2018	8,961	168,253	177,214	10,210	192,441	202,651	7,991	150,612	158,603
2019	9,065	170,203	179,268	10,451	196,979	207,430	7,997	150,733	158,730
2020	9,168	172,144	181,312	10,695	201,585	212,280	8,002	150,824	158,826
2021	9,271	174,083	183,354	10,943	206,264	217,208	8,006	150,891	158,896
2022	9,376	176,040	185,416	11,197	211,038	222,235	8,009	150,948	158,956
2023	9,480	178,001	187,482	11,454	215,894	227,349	8,011	150,985	158,995
2024	9,585	179,956	189,541	11,716	220,825	232,541	8,011	150,996	159,007
2025	9,690	181,914	191,604	11,982	225,840	237,822	8,011	150,989	159,000
2026	9,795	183,872	193,667	12,252	230,937	243,190	8,009	150,961	158,971
2027	9,900	185,831	195,731	12,527	236,119	248,646	8,007	150,914	158,921
2028	10,005	187,779	197,784	12,806	241,376	254,182	8,003	150,841	158,844
2029	10,110	189,726	199,836	13,090	246,718	259,808	7,998	150,748	158,746
2030	10,215	191,677	201,892	13,378	252,150	265,528	7,992	150,639	158,631

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
		Weather Sensitive	Total Core		Weather Sensitive	Total Core		Weather Sensitive	Total Core
Heating Season	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth	Daily Baseload Growth	Peak-Day Therms Growth	Peak-Day Therms Growth
2008	5.96%	4.14%	4.23%	5.96%	4.14%	4.23%	5.96%	4.14%	4.23%
2009	0.90%	0.76%	0.77%	2.14%	2.14%	2.14%	-0.14%	-0.14%	-0.14%
2010	1.00%	0.91%	0.92%	2.24%	2.24%	2.24%	-0.04%	-0.04%	-0.04%
2011	1.21%	1.00%	1.01%	2.47%	2.47%	2.47%	0.19%	0.19%	0.19%
2012	1.25%	1.26%	1.26%	2.49%	2.49%	2.49%	0.21%	0.21%	0.21%
2013	1.24%	1.25%	1.25%	2.47%	2.47%	2.47%	0.19%	0.19%	0.19%
2014	1.22%	1.23%	1.23%	2.45%	2.45%	2.45%	0.17%	0.17%	0.17%
2015	1.21%	1.22%	1.22%	2.43%	2.43%	2.43%	0.15%	0.15%	0.15%
2016	1.20%	1.21%	1.21%	2.41%	2.41%	2.41%	0.13%	0.13%	0.13%
2017	1.18%	1.18%	1.18%	2.39%	2.39%	2.39%	0.11%	0.11%	0.11%
2018	1.17%	1.17%	1.17%	2.38%	2.38%	2.38%	0.10%	0.10%	0.10%
2019	1.16%	1.16%	1.16%	2.36%	2.36%	2.36%	0.08%	0.08%	0.08%
2020	1.14%	1.14%	1.14%	2.34%	2.34%	2.34%	0.06%	0.06%	0.06%
2021	1.13%	1.13%	1.13%	2.32%	2.32%	2.32%	0.04%	0.04%	0.04%
2022	1.13%	1.12%	1.12%	2.31%	2.31%	2.31%	0.04%	0.04%	0.04%
2023	1.12%	1.11%	1.11%	2.30%	2.30%	2.30%	0.02%	0.02%	0.02%
2024	1.10%	1.10%	1.10%	2.28%	2.28%	2.28%	0.01%	0.01%	0.01%
2025	1.09%	1.09%	1.09%	2.27%	2.27%	2.27%	0.00%	0.00%	0.00%
2026	1.08%	1.08%	1.08%	2.26%	2.26%	2.26%	-0.02%	-0.02%	-0.02%
2027	1.07%	1.07%	1.07%	2.24%	2.24%	2.24%	-0.03%	-0.03%	-0.03%
2028	1.06%	1.05%	1.05%	2.23%	2.23%	2.23%	-0.05%	-0.05%	-0.05%
2029	1.05%	1.04%	1.04%	2.21%	2.21%	2.21%	-0.06%	-0.06%	-0.06%
2030	1.04%	1.03%	1.03%	2.20%	2.20%	2.20%	-0.07%	-0.07%	-0.07%

**Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Therm Consumption and Growth Rates
ZONE ME-WA**

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms	Residential Therms	Comm./ Ind. Therms	Total Therms
2008	6,993,771	4,258,161	11,251,932	7,134,346	4,341,579	11,475,924	6,854,595	4,175,552	11,030,147
2009	7,084,282	4,265,392	11,349,675	7,317,577	4,403,714	11,721,291	6,874,218	4,140,969	11,015,187
2010	7,183,292	4,276,421	11,459,713	7,513,178	4,470,692	11,983,869	6,900,937	4,110,312	11,011,249
2011	7,304,053	4,292,598	11,596,650	7,735,577	4,544,091	12,279,668	6,947,130	4,084,771	11,031,901
2012	7,424,278	4,313,327	11,737,605	7,961,808	4,623,498	12,585,306	6,991,218	4,063,629	11,054,847
2013	7,543,970	4,334,000	11,877,970	8,191,927	4,704,122	12,896,050	7,033,243	4,042,452	11,075,695
2014	7,663,130	4,354,372	12,017,502	8,425,991	4,785,715	13,211,706	7,073,248	4,021,014	11,094,263
2015	7,781,760	4,374,840	12,156,599	8,664,058	4,868,719	13,532,777	7,111,277	3,999,692	11,110,969
2016	7,899,861	4,395,474	12,295,335	8,906,184	4,953,240	13,859,424	7,147,371	3,978,550	11,125,920
2017	8,017,436	4,415,143	12,432,579	9,152,430	5,038,025	14,190,454	7,181,570	3,956,559	11,138,129
2018	8,134,486	4,435,327	12,569,814	9,402,854	5,124,747	14,527,601	7,213,916	3,935,075	11,148,991
2019	8,251,013	4,455,332	12,706,345	9,657,518	5,212,645	14,870,163	7,244,448	3,913,468	11,157,916
2020	8,367,018	4,474,857	12,841,875	9,916,482	5,301,378	15,217,860	7,273,204	3,891,481	11,164,685
2021	8,482,503	4,494,227	12,976,730	10,179,809	5,391,334	15,571,144	7,300,223	3,869,411	11,169,634
2022	8,597,470	4,514,651	13,112,121	10,447,562	5,483,982	15,931,544	7,325,543	3,848,302	11,173,846
2023	8,711,921	4,535,250	13,247,171	10,719,805	5,578,320	16,298,124	7,349,201	3,827,381	11,176,582
2024	8,825,856	4,555,496	13,381,352	10,996,601	5,673,725	16,670,326	7,371,232	3,806,197	11,177,430
2025	8,939,278	4,575,931	13,515,209	11,278,017	5,770,883	17,048,900	7,391,673	3,785,215	11,176,889
2026	9,052,188	4,596,391	13,648,579	11,564,119	5,869,619	17,433,738	7,410,559	3,764,296	11,174,854
2027	9,164,588	4,616,857	13,781,445	11,854,975	5,969,931	17,824,906	7,427,923	3,743,423	11,171,346
2028	9,276,480	4,636,752	13,913,233	12,150,652	6,071,097	18,221,749	7,443,800	3,722,132	11,165,932
2029	9,387,865	4,656,616	14,044,482	12,451,219	6,173,822	18,625,041	7,458,223	3,700,869	11,159,092
2030	9,498,745	4,676,620	14,175,365	12,756,747	6,278,353	19,035,101	7,471,225	3,679,772	11,150,997

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Heating Season	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth	Residential Therms Growth	Comm./ Ind. Therms Growth	Total Therms Growth
2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2009	1.29%	0.17%	0.87%	2.57%	1.43%	2.14%	0.29%	-0.83%	-0.14%
2010	1.40%	0.26%	0.97%	2.67%	1.52%	2.24%	0.39%	-0.74%	-0.04%
2011	1.68%	0.38%	1.19%	2.96%	1.64%	2.47%	0.67%	-0.62%	0.19%
2012	1.65%	0.48%	1.22%	2.92%	1.75%	2.49%	0.63%	-0.52%	0.21%
2013	1.61%	0.48%	1.20%	2.89%	1.74%	2.47%	0.60%	-0.52%	0.19%
2014	1.58%	0.47%	1.17%	2.86%	1.73%	2.45%	0.57%	-0.53%	0.17%
2015	1.55%	0.47%	1.16%	2.83%	1.73%	2.43%	0.54%	-0.53%	0.15%
2016	1.52%	0.47%	1.14%	2.79%	1.74%	2.41%	0.51%	-0.53%	0.13%
2017	1.49%	0.45%	1.12%	2.76%	1.71%	2.39%	0.48%	-0.55%	0.11%
2018	1.46%	0.46%	1.10%	2.74%	1.72%	2.38%	0.45%	-0.54%	0.10%
2019	1.43%	0.45%	1.09%	2.71%	1.72%	2.36%	0.42%	-0.55%	0.08%
2020	1.41%	0.44%	1.07%	2.68%	1.70%	2.34%	0.40%	-0.56%	0.06%
2021	1.38%	0.43%	1.05%	2.66%	1.70%	2.32%	0.37%	-0.57%	0.04%
2022	1.36%	0.45%	1.04%	2.63%	1.72%	2.31%	0.35%	-0.55%	0.04%
2023	1.33%	0.46%	1.03%	2.61%	1.72%	2.30%	0.32%	-0.54%	0.02%
2024	1.31%	0.45%	1.01%	2.58%	1.71%	2.28%	0.30%	-0.55%	0.01%
2025	1.29%	0.45%	1.00%	2.56%	1.71%	2.27%	0.28%	-0.55%	0.00%
2026	1.26%	0.45%	0.99%	2.54%	1.71%	2.26%	0.26%	-0.55%	-0.02%
2027	1.24%	0.45%	0.97%	2.52%	1.71%	2.24%	0.23%	-0.55%	-0.03%
2028	1.22%	0.43%	0.96%	2.49%	1.69%	2.23%	0.21%	-0.57%	-0.05%
2029	1.20%	0.43%	0.94%	2.47%	1.69%	2.21%	0.19%	-0.57%	-0.06%
2030	1.18%	0.43%	0.93%	2.45%	1.69%	2.20%	0.17%	-0.57%	-0.07%

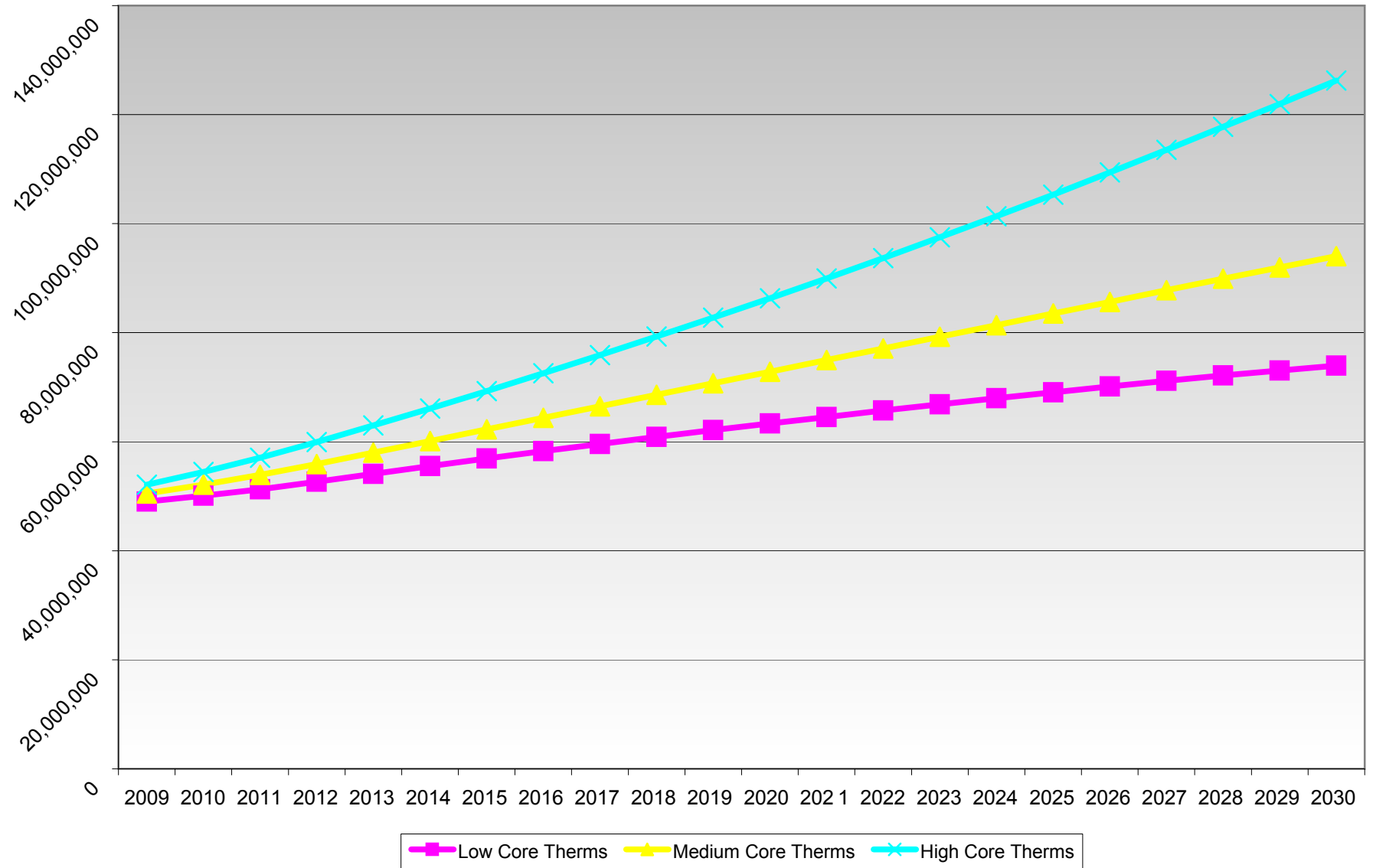
Cascade Natural Gas Corporation
Demand Forecast Summary Table
Annual Customer Forecast and Growth Rates
ZONE ME-WA

Customer Forecast									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	10,240	1,192	11,432	10,342	1,204	11,546	10,137	1,180	11,318
2009	10,394	1,198	11,592	10,630	1,225	11,855	10,188	1,174	11,362
2010	10,561	1,205	11,766	10,937	1,248	12,185	10,249	1,169	11,418
2011	10,761	1,213	11,974	11,284	1,272	12,556	10,339	1,166	11,504
2012	10,961	1,222	12,183	11,639	1,298	12,936	10,426	1,163	11,589
2013	11,161	1,231	12,392	12,000	1,324	13,324	10,511	1,159	11,670
2014	11,361	1,240	12,601	12,369	1,350	13,719	10,593	1,156	11,749
2015	11,561	1,249	12,810	12,745	1,377	14,122	10,672	1,153	11,825
2016	11,761	1,258	13,019	13,128	1,404	14,533	10,748	1,150	11,898
2017	11,961	1,267	13,228	13,519	1,432	14,952	10,822	1,147	11,969
2018	12,161	1,276	13,437	13,918	1,461	15,379	10,894	1,143	12,037
2019	12,361	1,285	13,646	14,325	1,489	15,815	10,963	1,140	12,103
2020	12,561	1,294	13,855	14,740	1,519	16,259	11,029	1,136	12,166
2021	12,761	1,303	14,064	15,163	1,548	16,712	11,094	1,133	12,226
2022	12,961	1,312	14,273	15,594	1,579	17,173	11,155	1,129	12,285
2023	13,161	1,321	14,482	16,034	1,610	17,644	11,215	1,126	12,341
2024	13,361	1,330	14,691	16,483	1,641	18,124	11,272	1,122	12,394
2025	13,561	1,339	14,900	16,940	1,673	18,613	11,327	1,119	12,445
2026	13,761	1,348	15,109	17,406	1,705	19,111	11,379	1,115	12,494
2027	13,961	1,357	15,318	17,881	1,738	19,619	11,430	1,111	12,541
2028	14,161	1,366	15,527	18,365	1,772	20,137	11,478	1,107	12,586
2029	14,361	1,375	15,736	18,859	1,806	20,665	11,525	1,104	12,628
2030	14,561	1,384	15,945	19,362	1,841	21,203	11,569	1,100	12,669

Annual Growth Rates									
	Medium Forecast			High Forecast			Low Forecast		
Year	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers	Residential Customers	Comm./ Ind. Customers	Total Customers
2008	1.33%	0.44%	1.24%	1.33%	0.44%	1.24%	1.33%	0.44%	1.24%
2009	1.51%	0.50%	1.40%	2.78%	1.77%	2.68%	0.50%	-0.50%	0.39%
2010	1.61%	0.58%	1.50%	2.89%	1.85%	2.78%	0.60%	-0.42%	0.49%
2011	1.89%	0.66%	1.77%	3.18%	1.93%	3.05%	0.88%	-0.34%	0.76%
2012	1.86%	0.74%	1.75%	3.14%	2.01%	3.03%	0.85%	-0.26%	0.73%
2013	1.82%	0.74%	1.72%	3.11%	2.00%	2.99%	0.81%	-0.27%	0.70%
2014	1.79%	0.73%	1.69%	3.07%	2.00%	2.97%	0.78%	-0.27%	0.67%
2015	1.76%	0.73%	1.66%	3.04%	1.99%	2.94%	0.75%	-0.28%	0.65%
2016	1.73%	0.72%	1.63%	3.01%	1.99%	2.91%	0.72%	-0.28%	0.62%
2017	1.70%	0.72%	1.61%	2.98%	1.98%	2.88%	0.69%	-0.29%	0.59%
2018	1.67%	0.71%	1.58%	2.95%	1.98%	2.86%	0.66%	-0.29%	0.57%
2019	1.64%	0.71%	1.56%	2.92%	1.97%	2.83%	0.63%	-0.30%	0.54%
2020	1.62%	0.70%	1.53%	2.90%	1.97%	2.81%	0.61%	-0.30%	0.52%
2021	1.59%	0.70%	1.51%	2.87%	1.96%	2.79%	0.58%	-0.31%	0.50%
2022	1.57%	0.69%	1.49%	2.84%	1.96%	2.76%	0.56%	-0.31%	0.48%
2023	1.54%	0.69%	1.46%	2.82%	1.95%	2.74%	0.53%	-0.32%	0.45%
2024	1.52%	0.68%	1.44%	2.80%	1.95%	2.72%	0.51%	-0.32%	0.43%
2025	1.50%	0.68%	1.42%	2.77%	1.94%	2.70%	0.49%	-0.33%	0.41%
2026	1.47%	0.67%	1.40%	2.75%	1.94%	2.68%	0.47%	-0.33%	0.39%
2027	1.45%	0.67%	1.38%	2.73%	1.93%	2.66%	0.44%	-0.33%	0.37%
2028	1.43%	0.66%	1.36%	2.71%	1.93%	2.64%	0.42%	-0.34%	0.36%
2029	1.41%	0.66%	1.35%	2.69%	1.92%	2.62%	0.40%	-0.34%	0.34%
2030	1.39%	0.65%	1.33%	2.67%	1.92%	2.60%	0.38%	-0.35%	0.32%

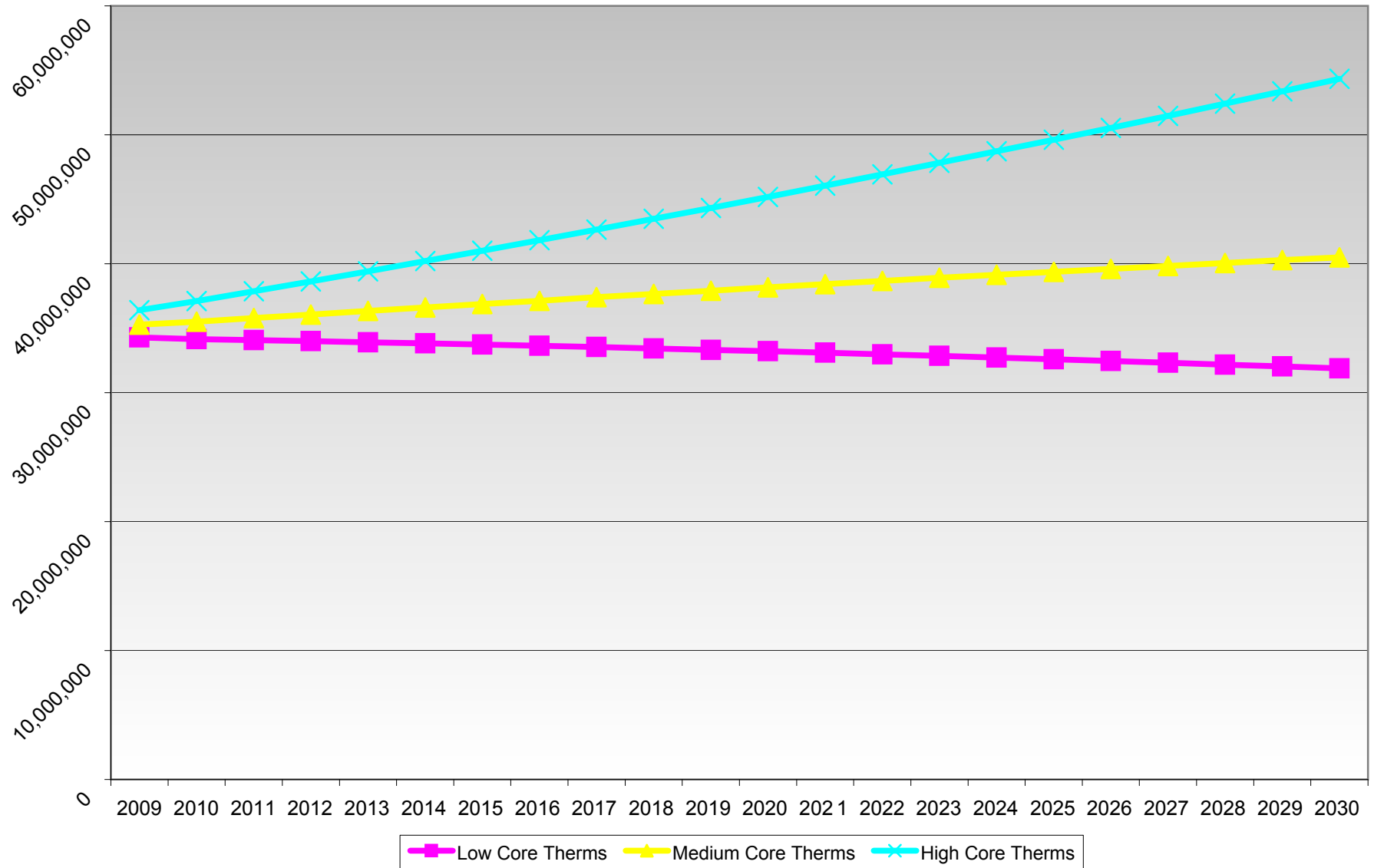
Therms

GTN (BEND AREA)



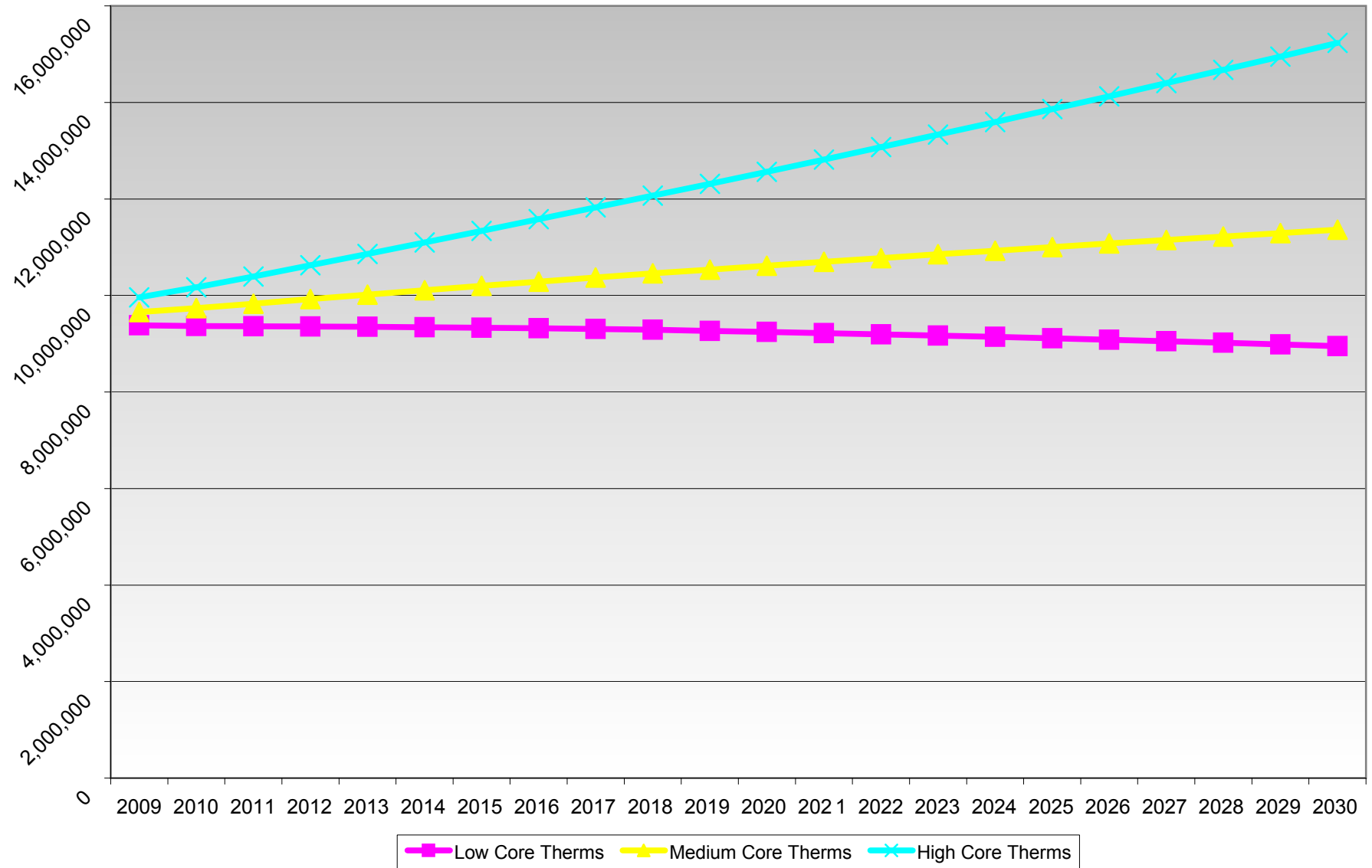
Therms

ZONE 11 (YAKIMA AREA)



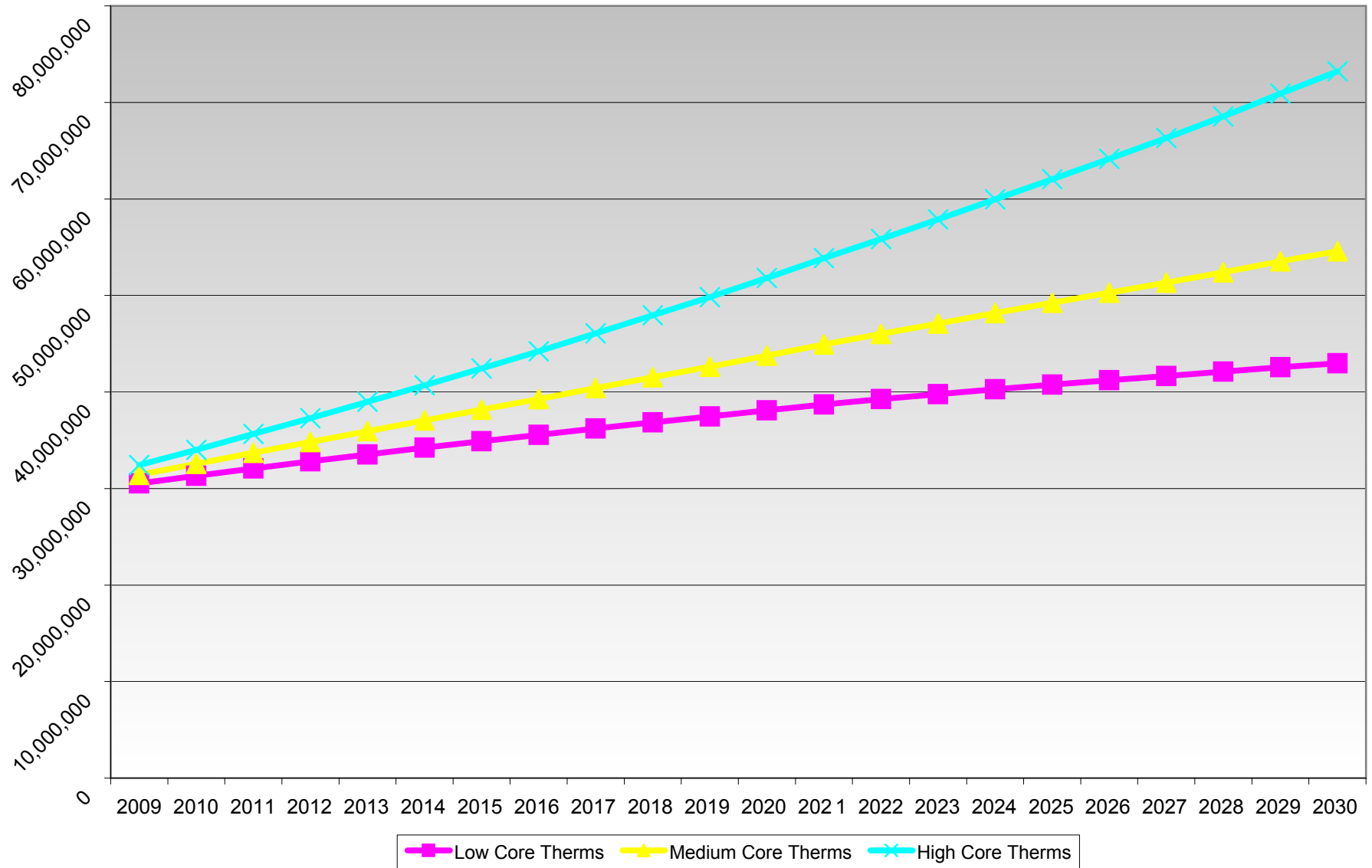
Therms

ZONE 10 (SUNNYSIDE AREA)



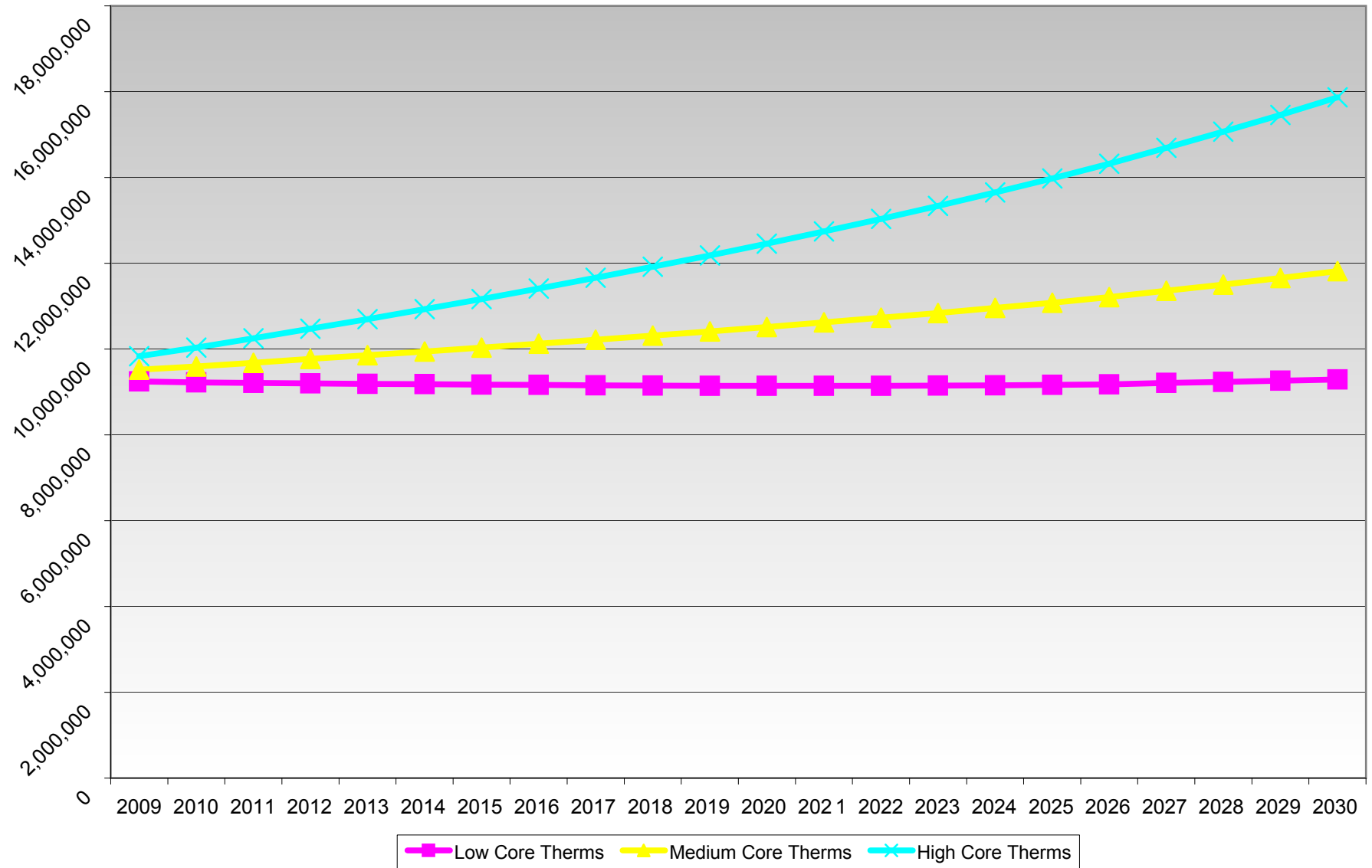
Therms

ZONE 20 (KENNEWICK AREA)



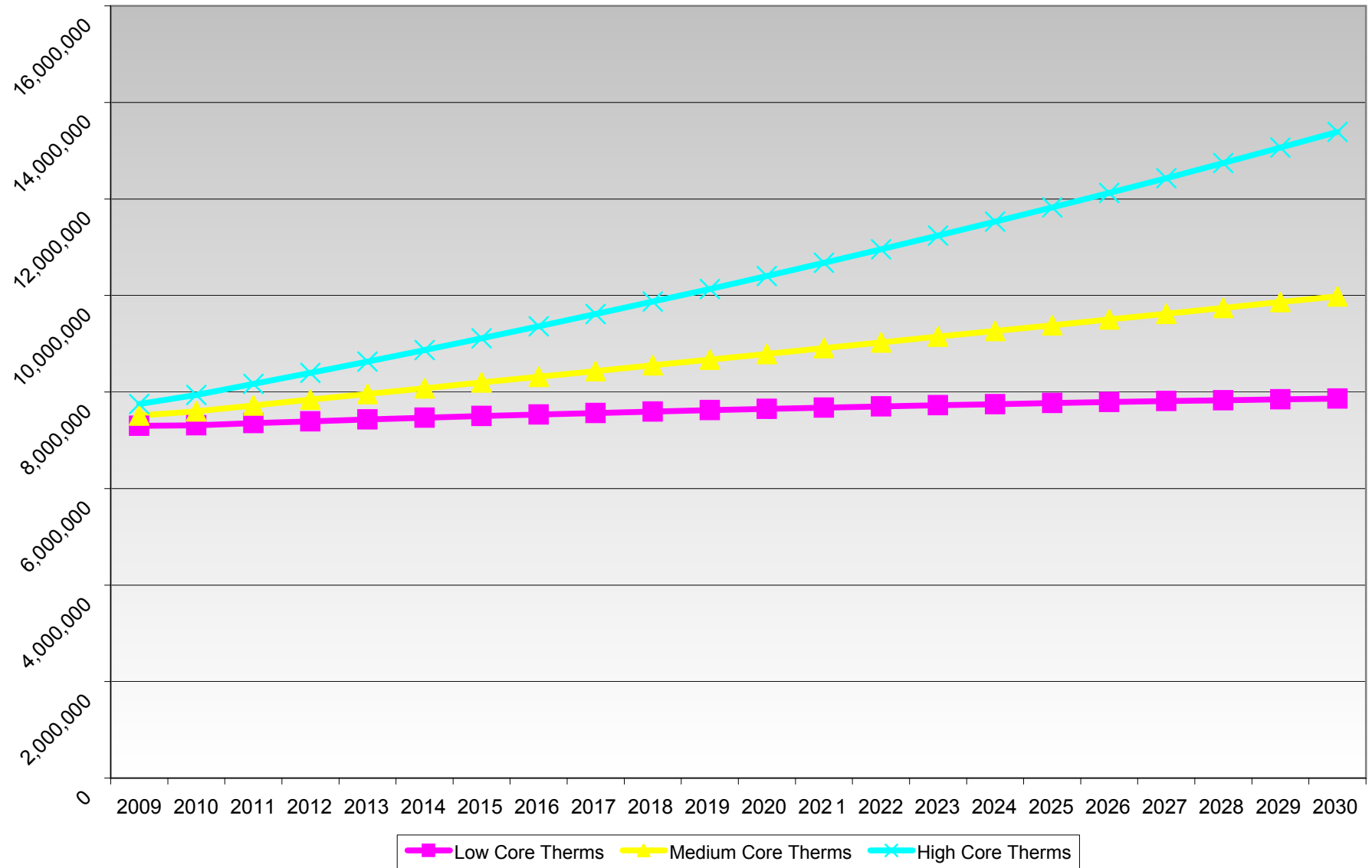
Therms

ZONE 24 (BAKERONT)



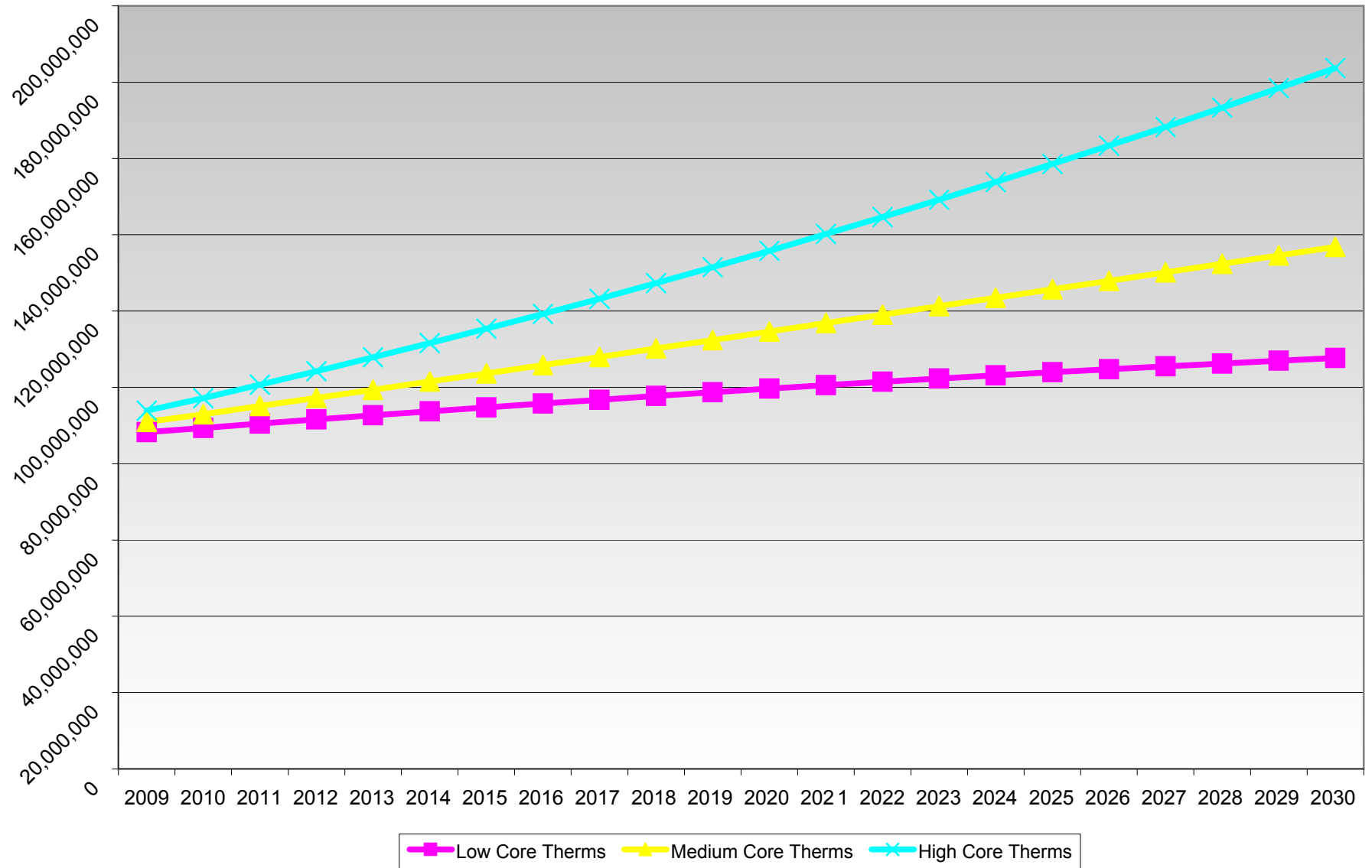
Therms

ZONE 26 (LONGVIEW AREA)



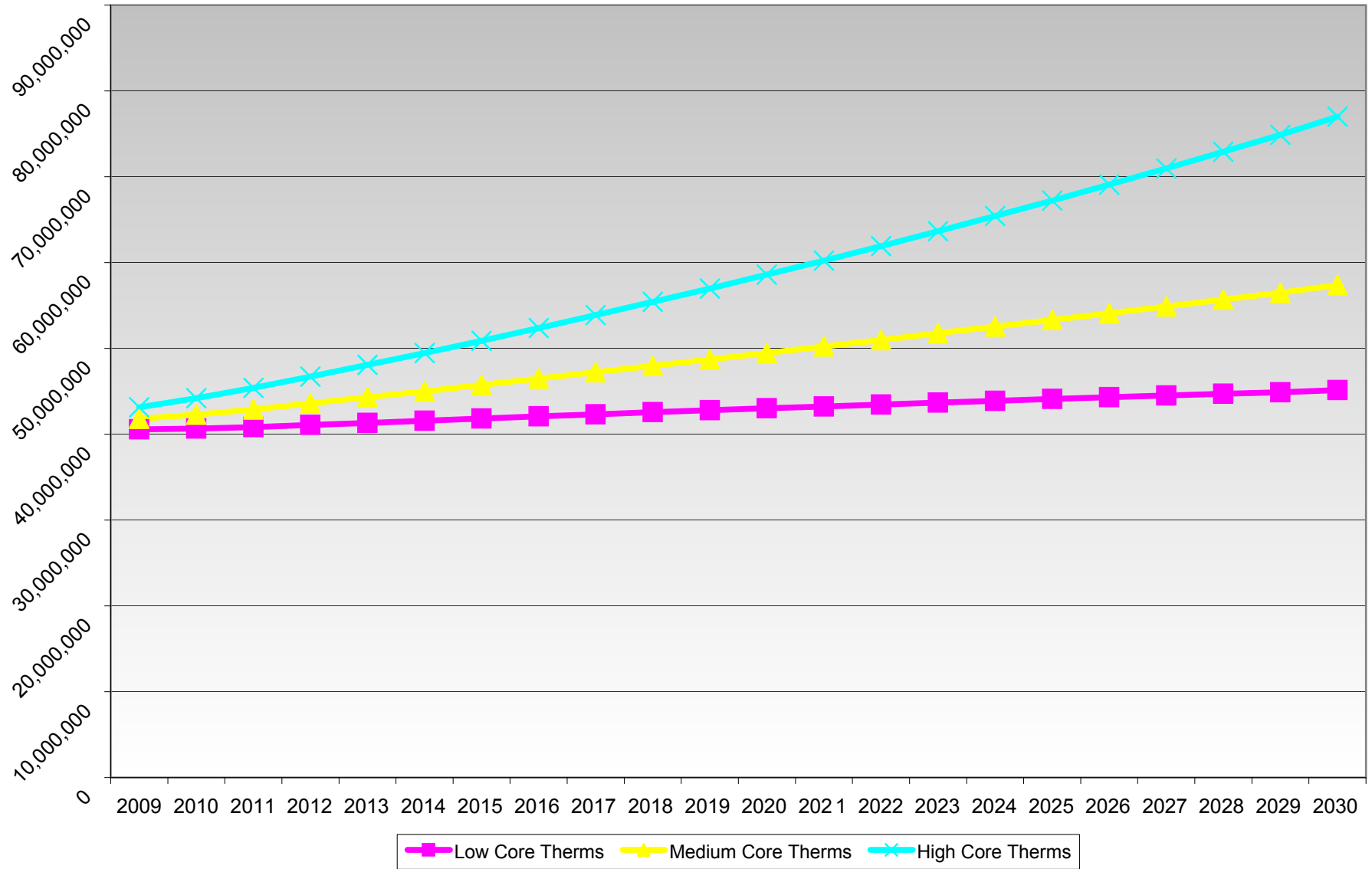
Therms

ZONE 30-W (BELLINGHAM/MT VERNON AREAS)



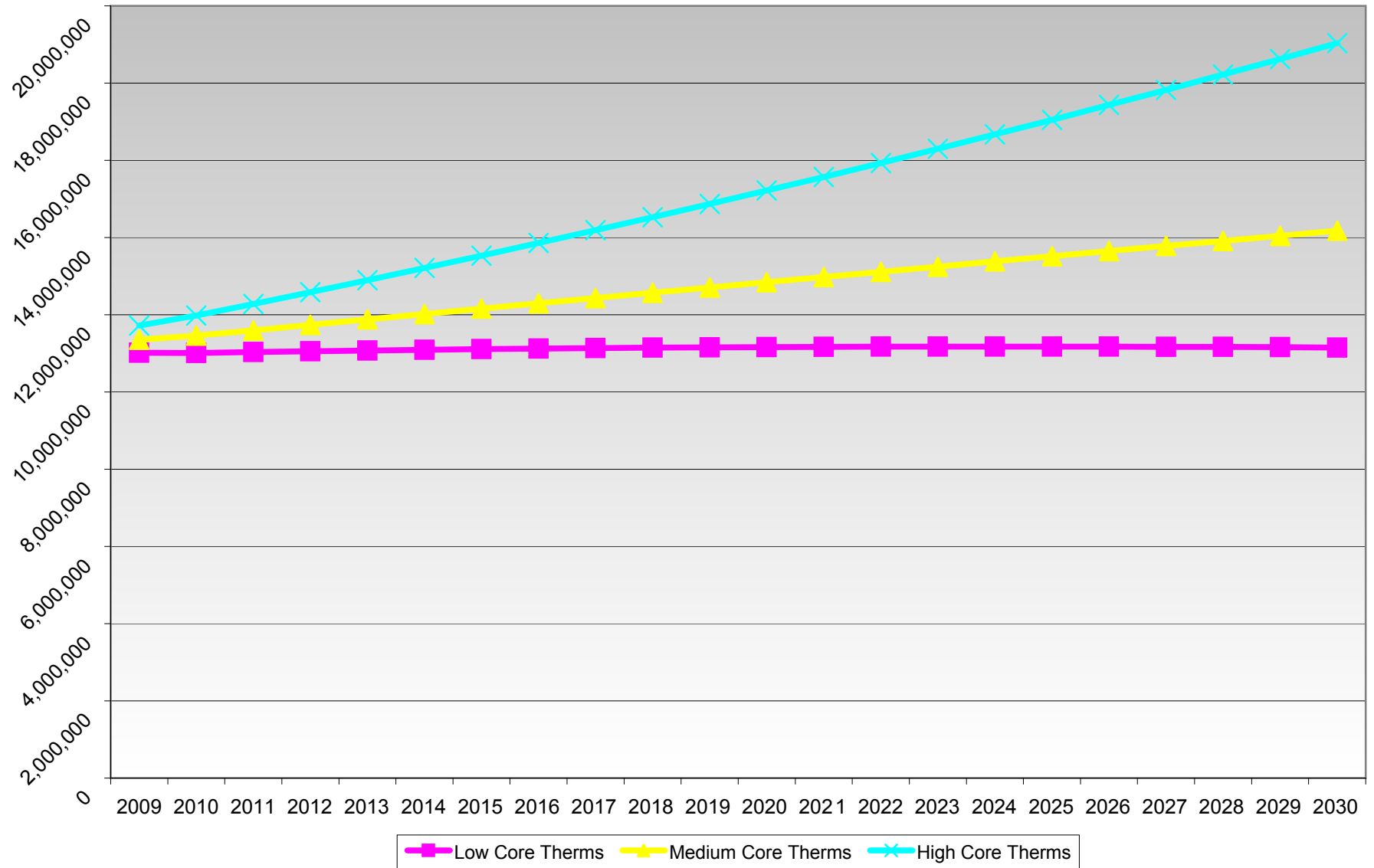
Therms

ZONE 30-S (BREMERTON/GRAYS HARBOR AREAS)



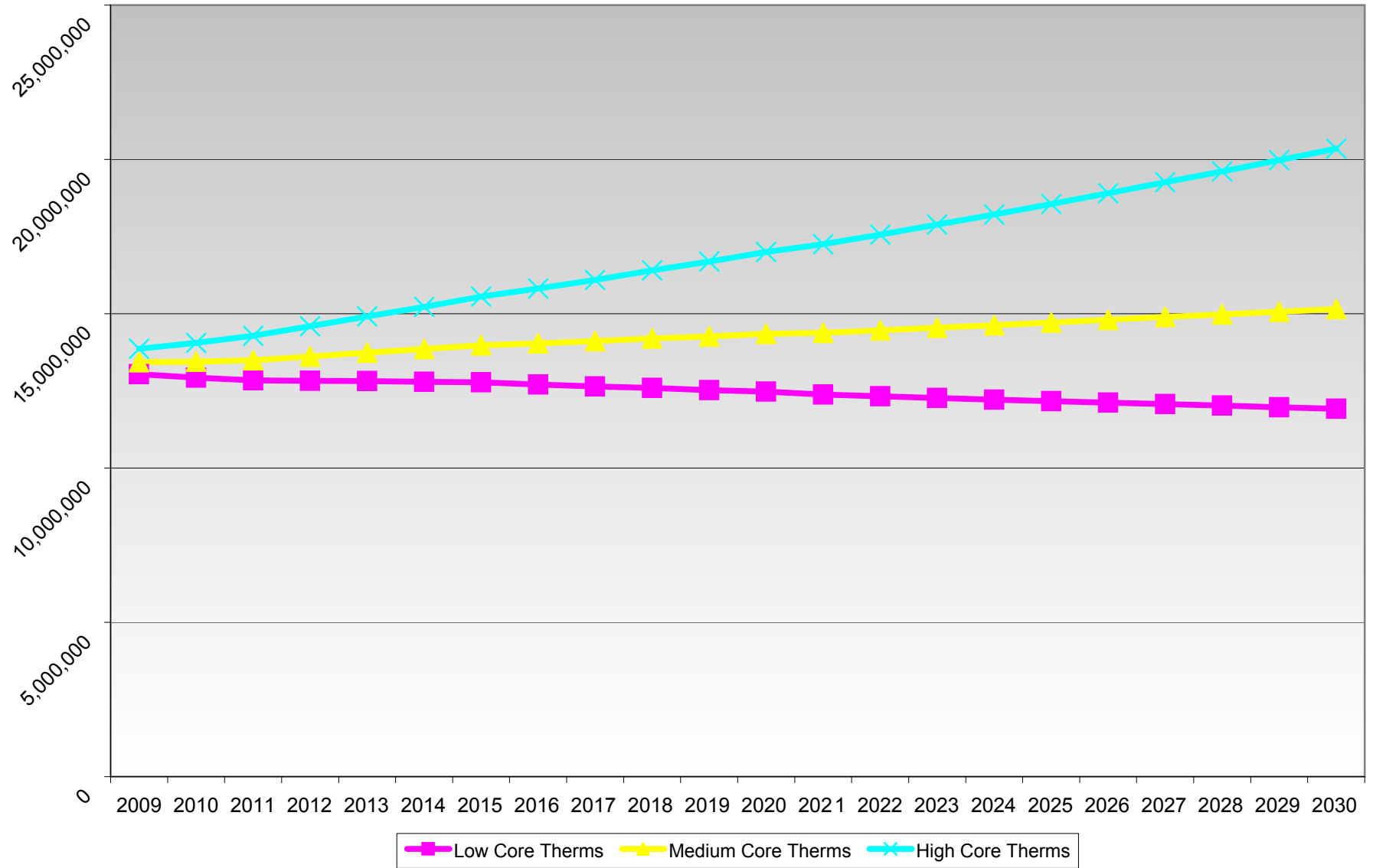
Therms

ZONE ME-WA (WALLA WALLA)



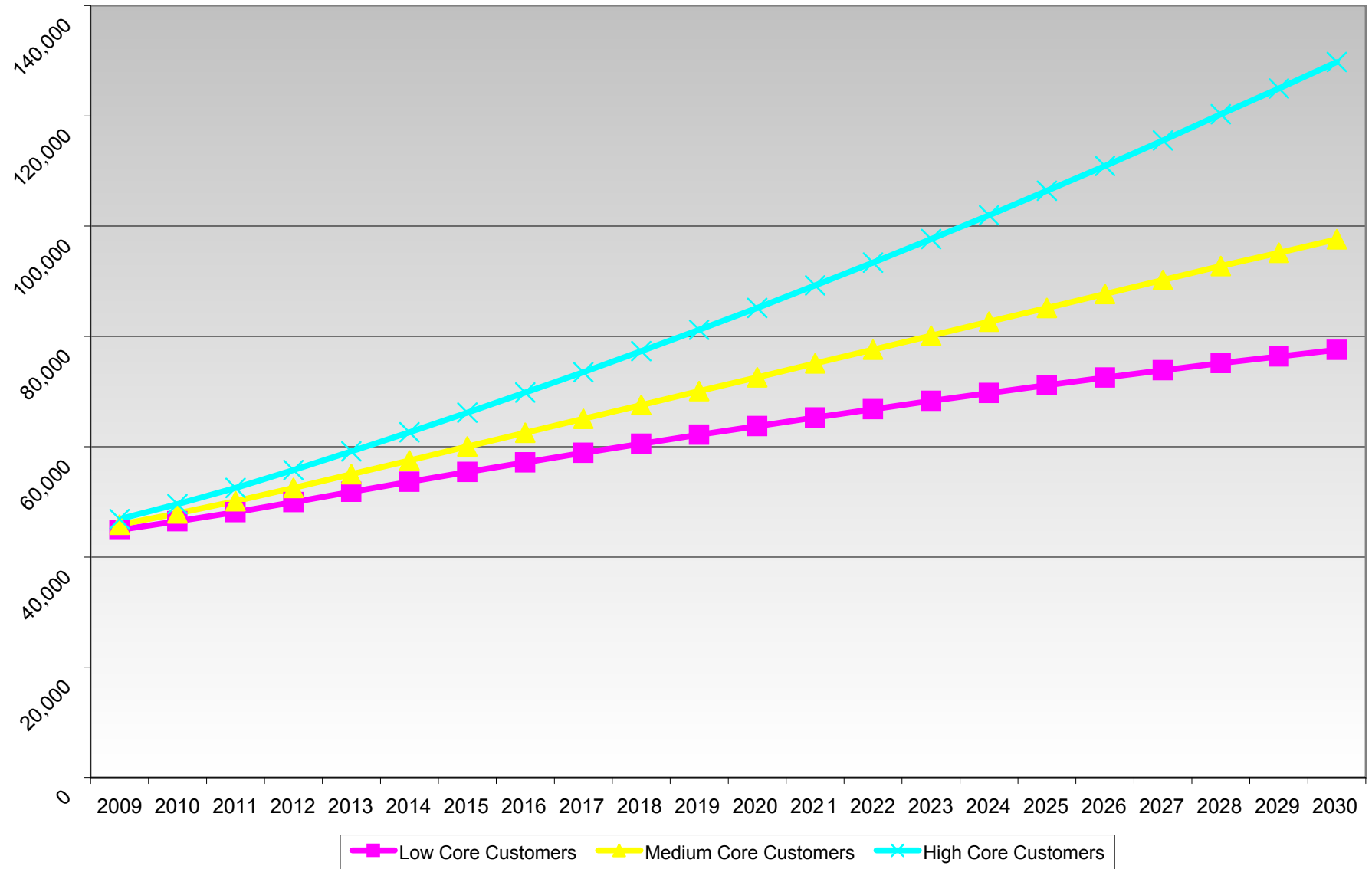
Therms

ZONE ME-OR (PENDLETON)



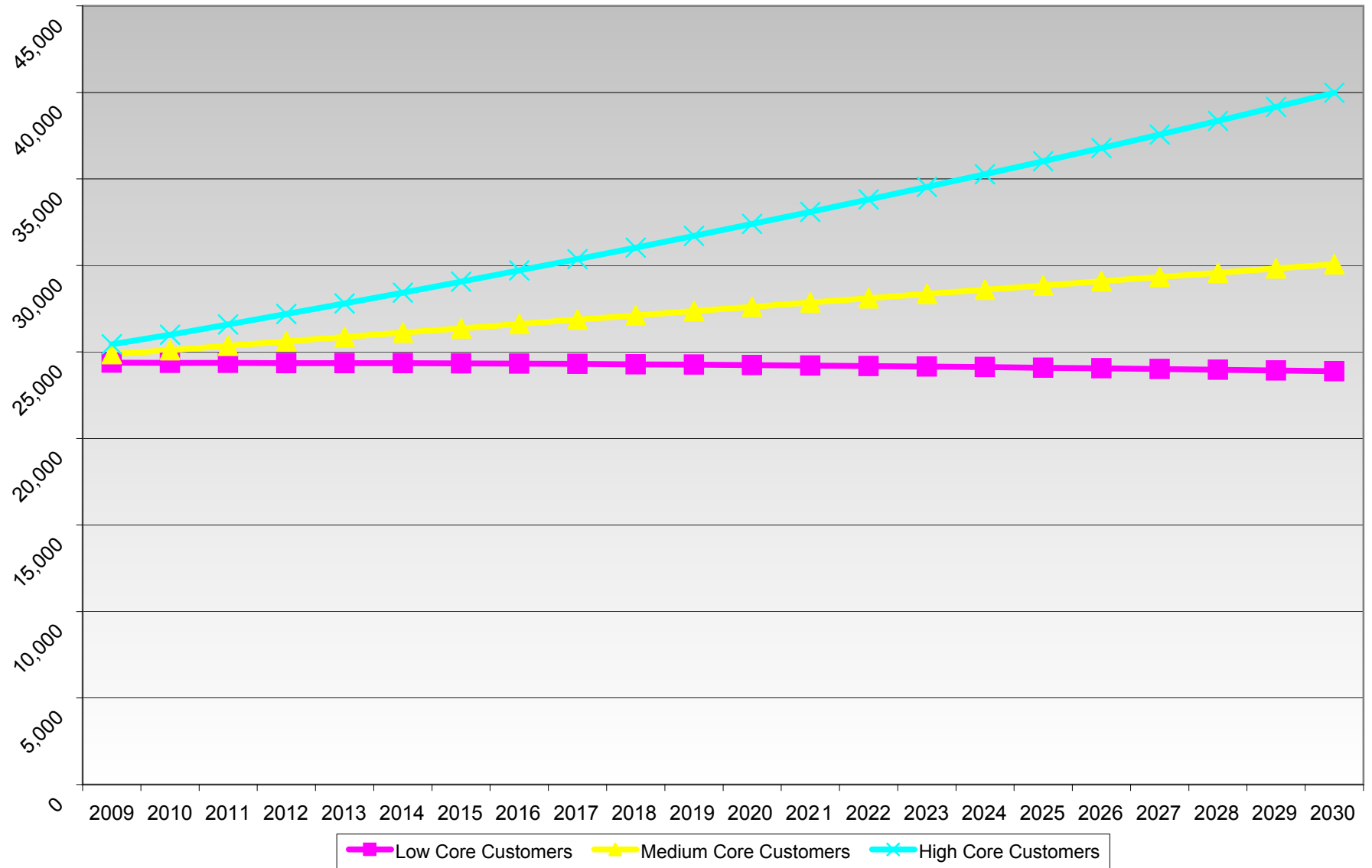
Customers

GTN (BEND AREA)



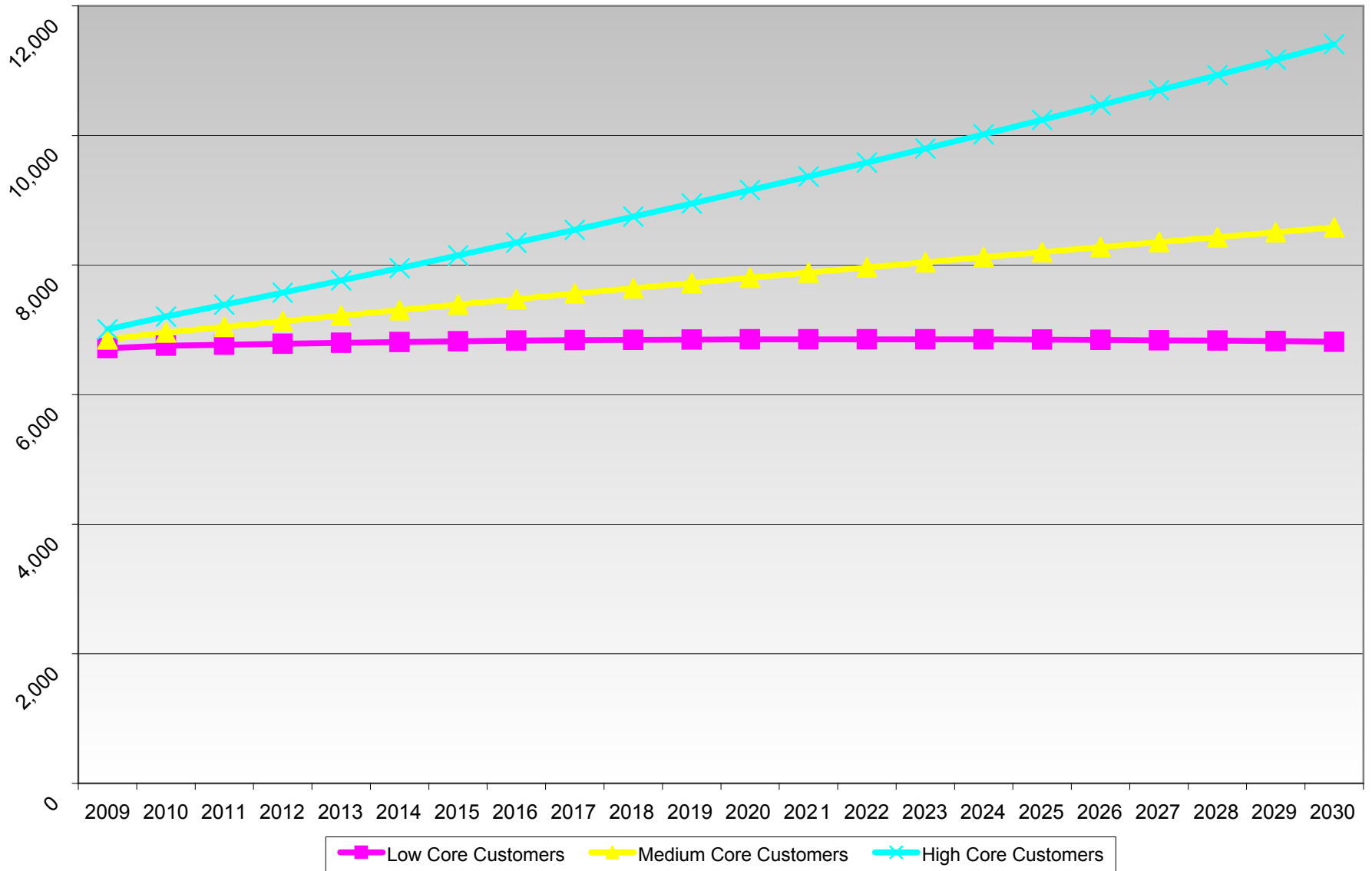
Customers

ZONE 11 (YAKIMA AREA)



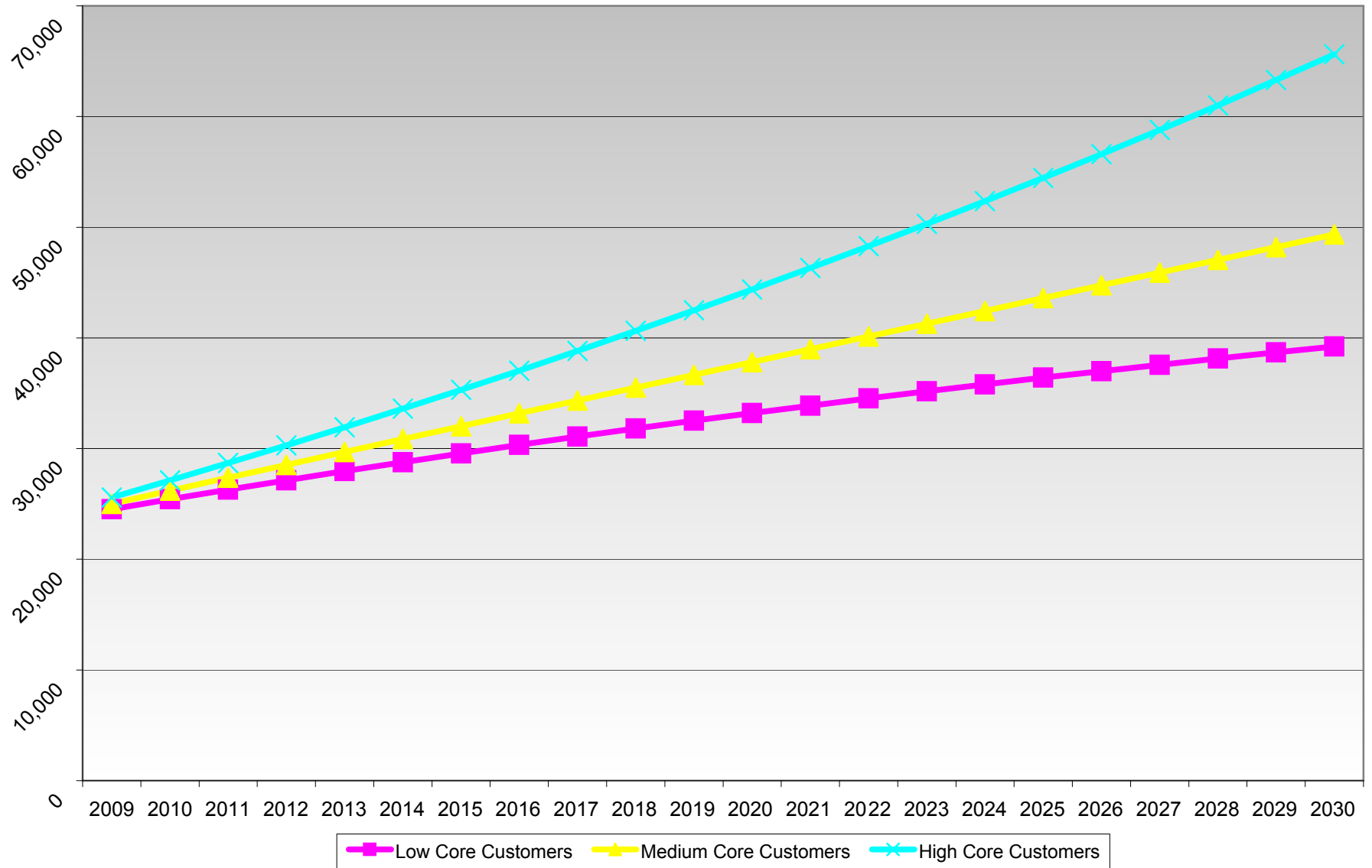
Customers

ZONE 10 (SUNNYSIDE AREA)



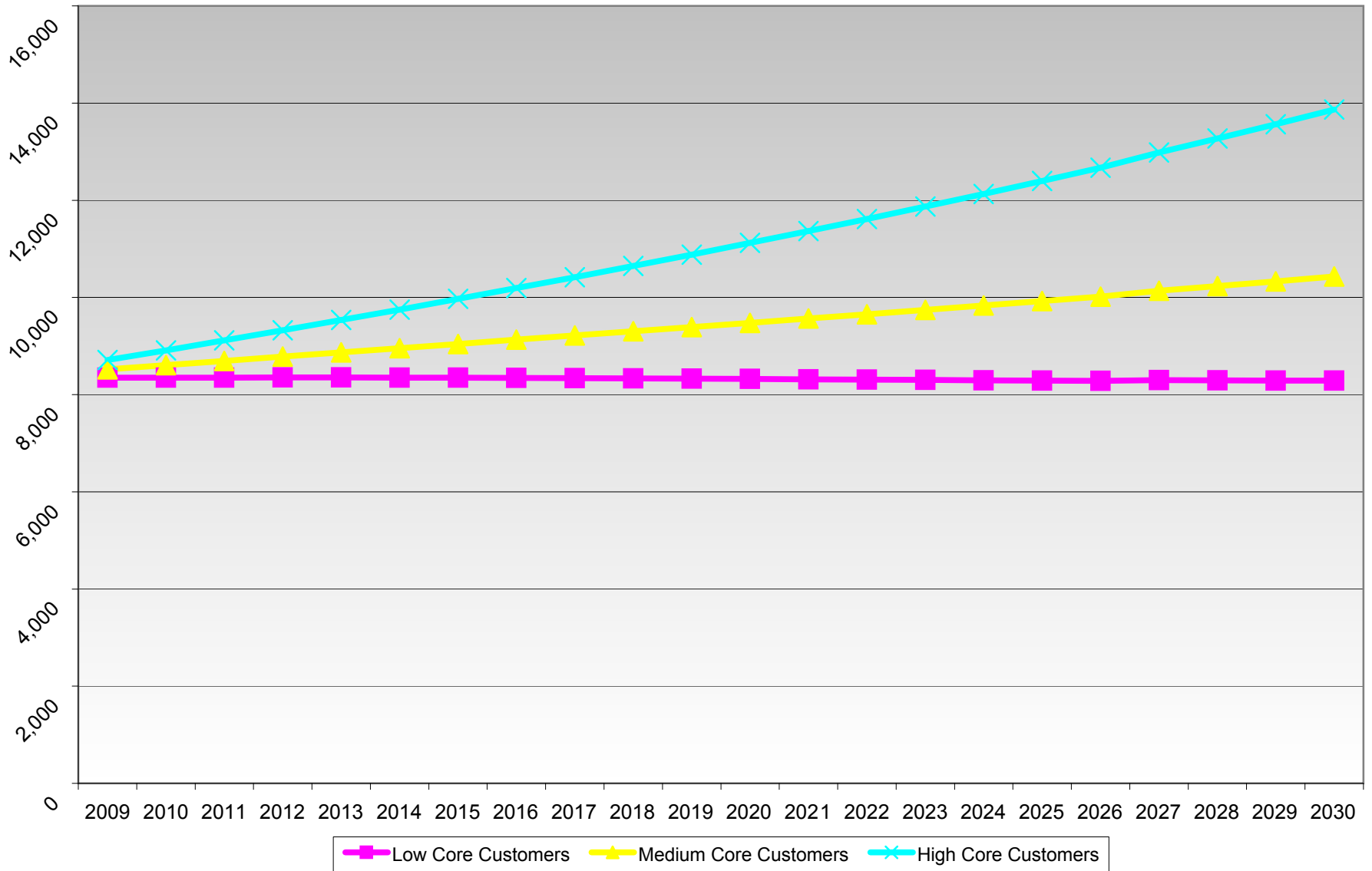
Customers

ZONE 20 (KENNEWICK AREA)



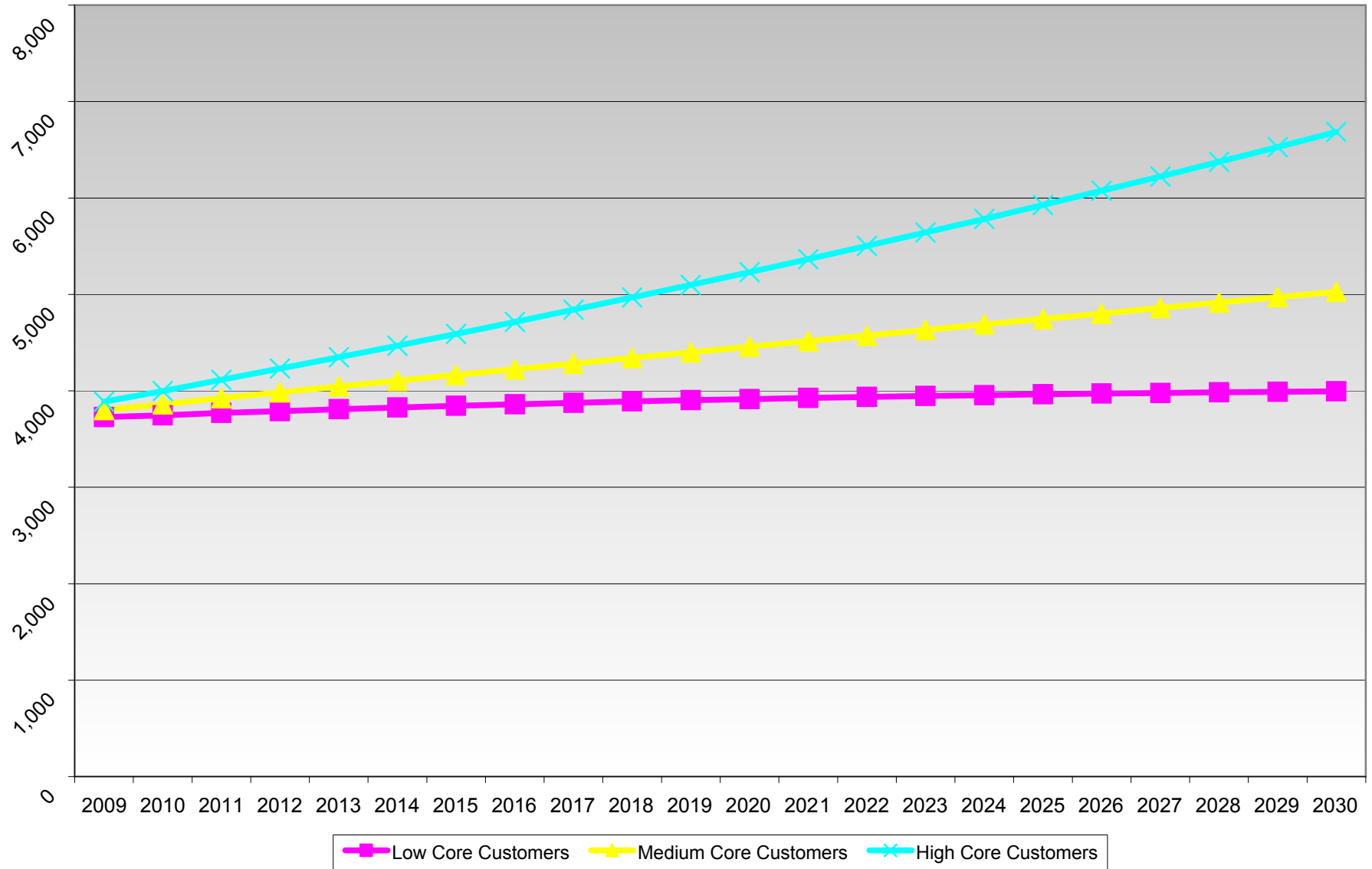
Customers

ZONE 24 (BAKERONT)



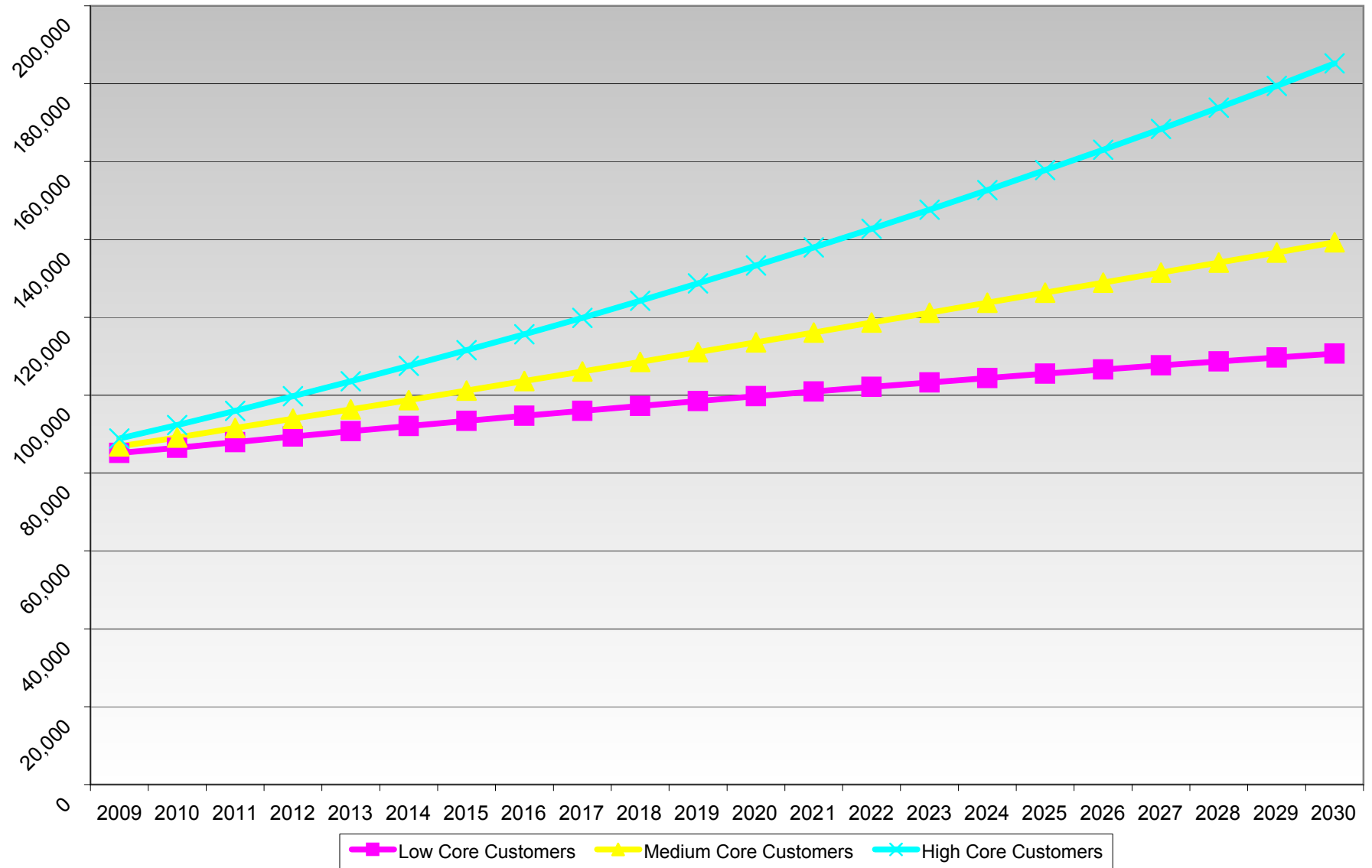
Customers

ZONE 26 (LONGVIEW AREA)



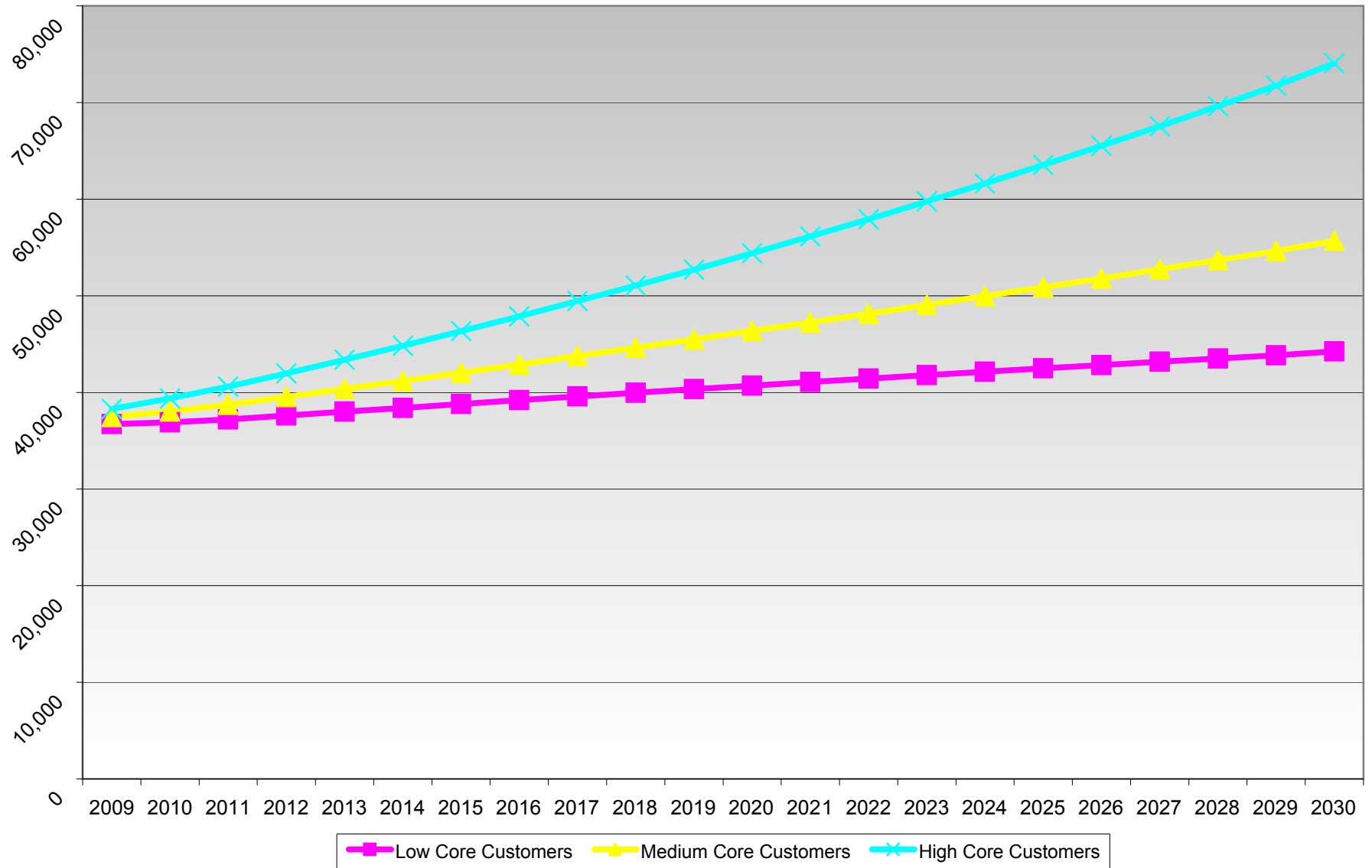
Customers

ZONE 30-W (BELLINGHAM/MT VERNON AREAS)



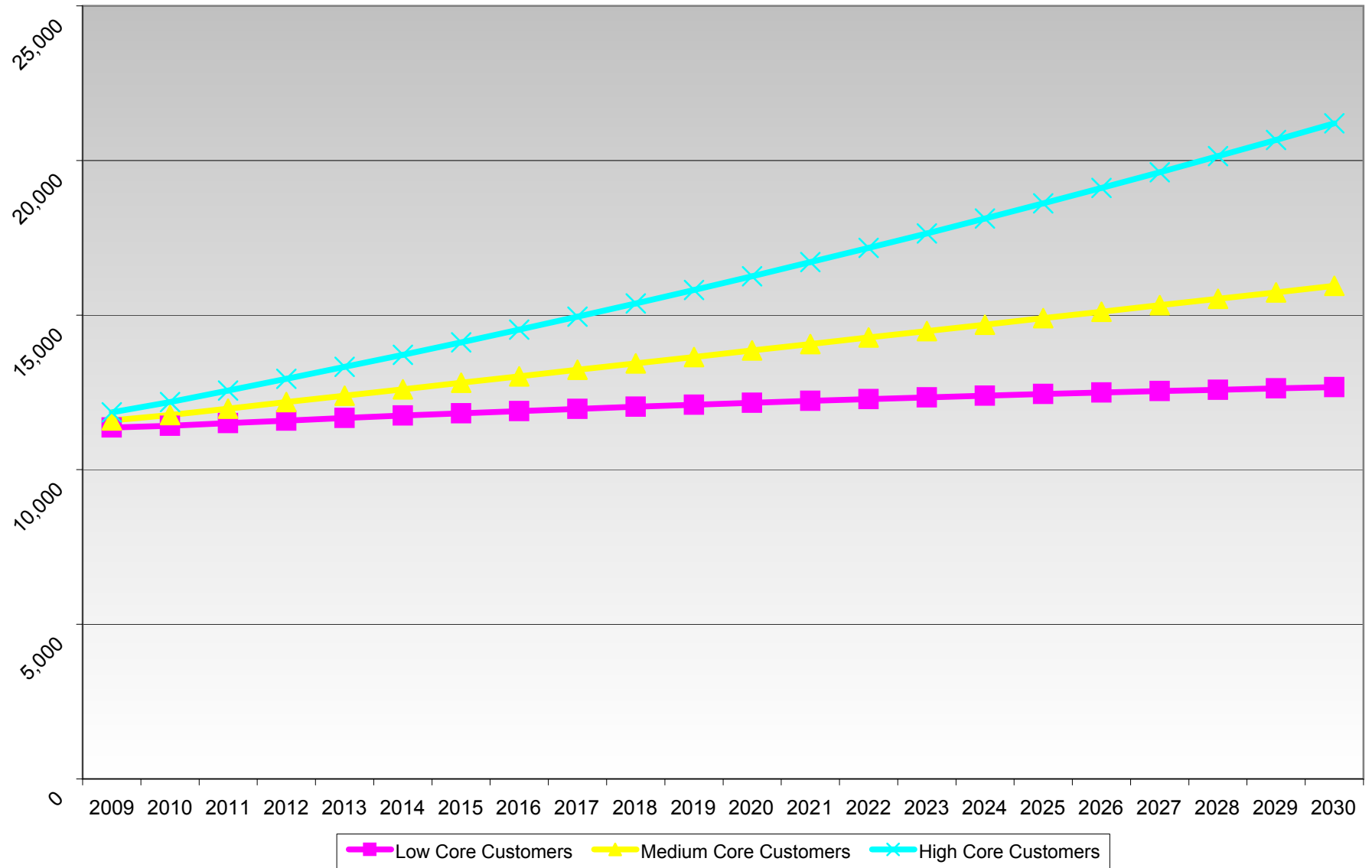
Customers

ZONE 30-S (BREMERTON/GRAYS HARBOR AREAS)



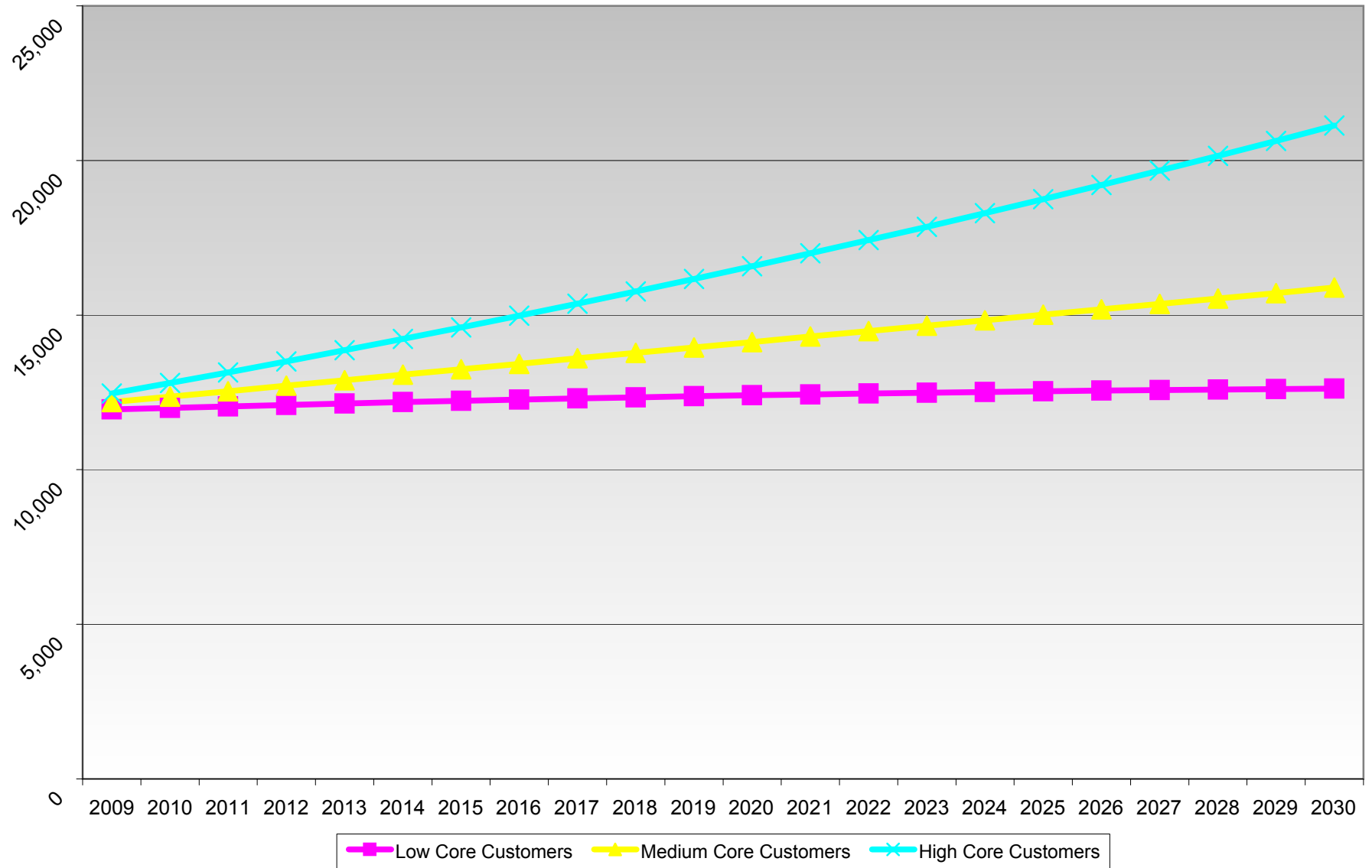
Customers

ZONE ME-WA (WALLA WALLA)



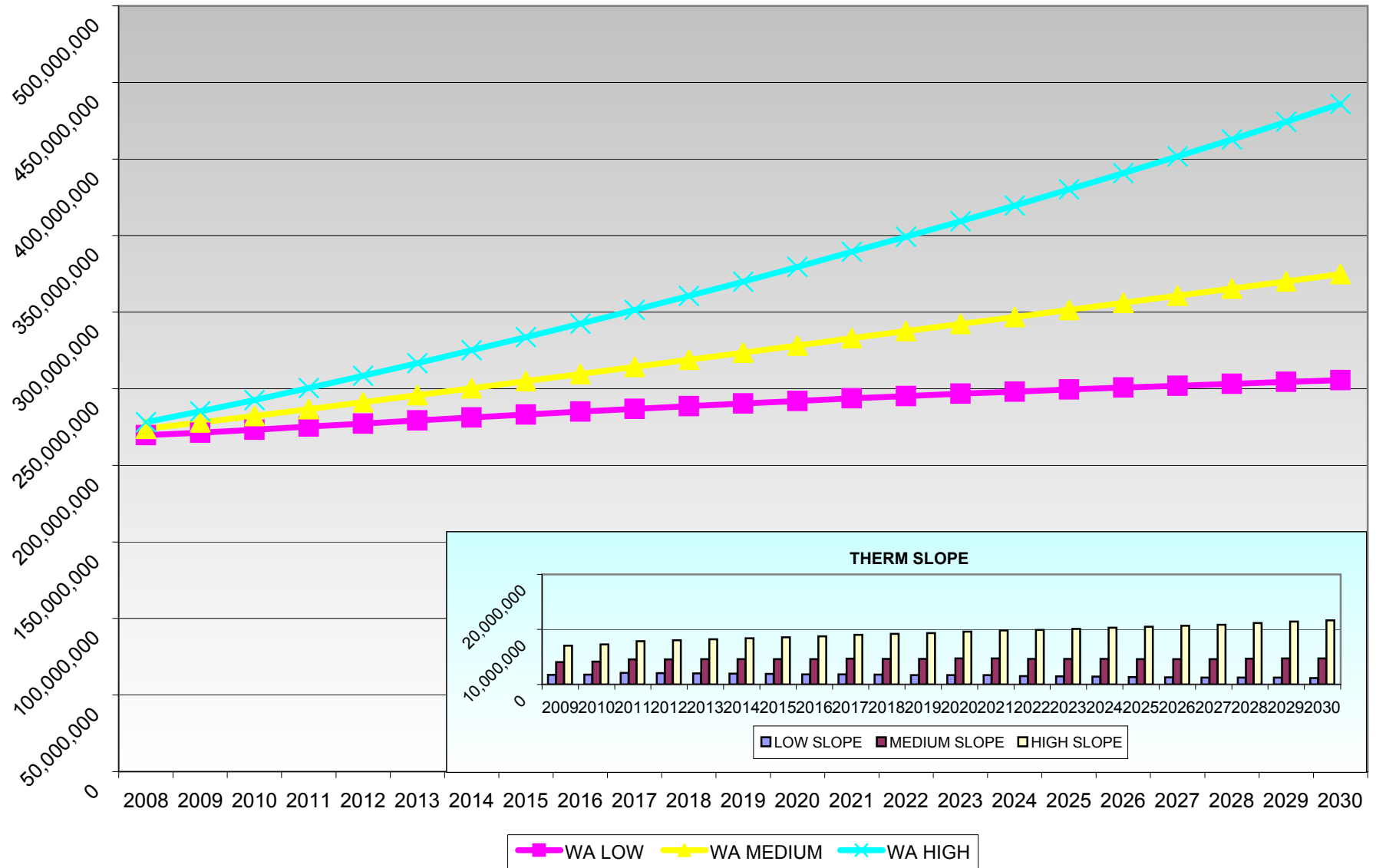
Customers

ZONE ME-OR (PENDLETON)



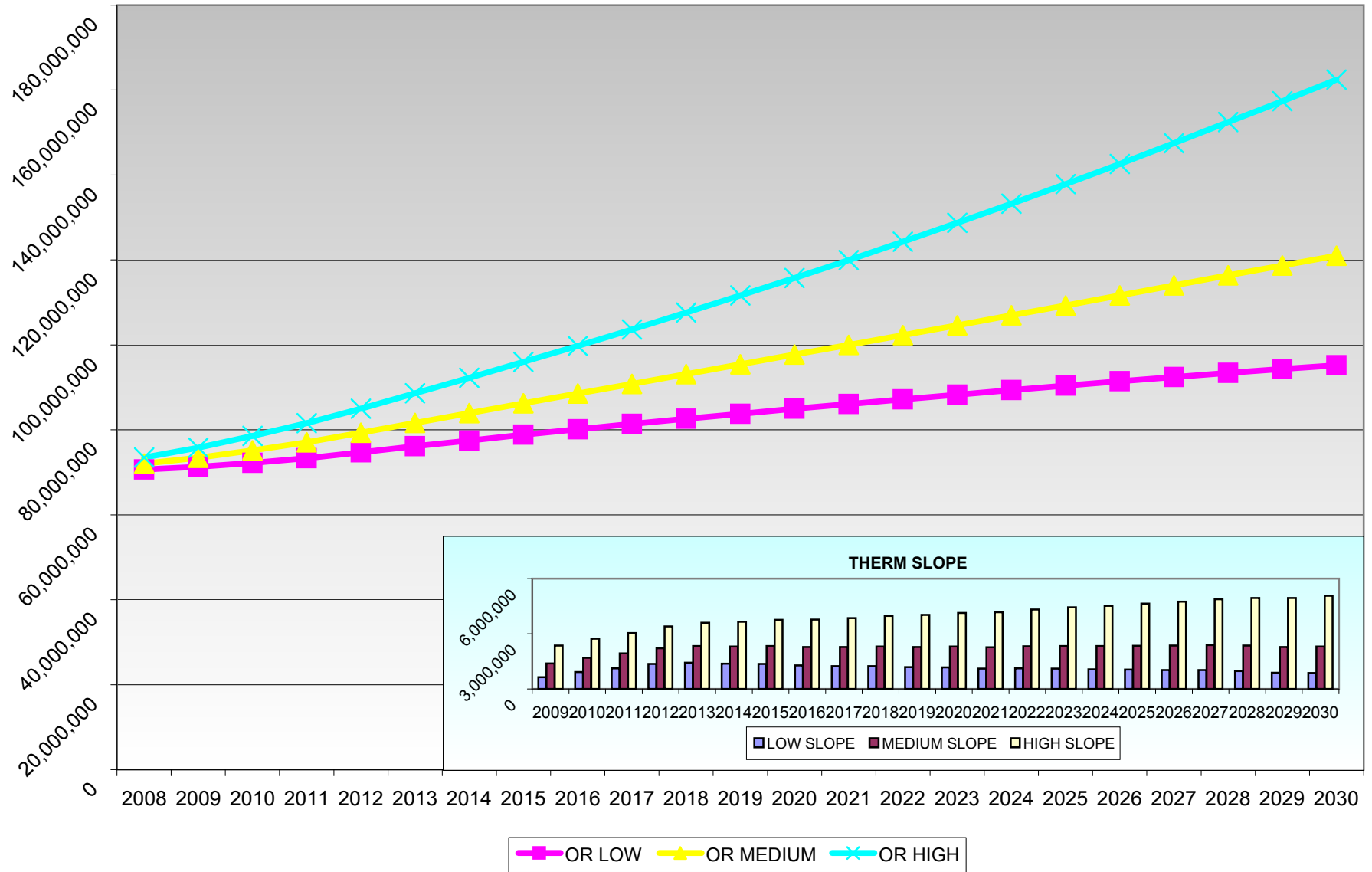
Therms

WA TOTAL THERM USAGE



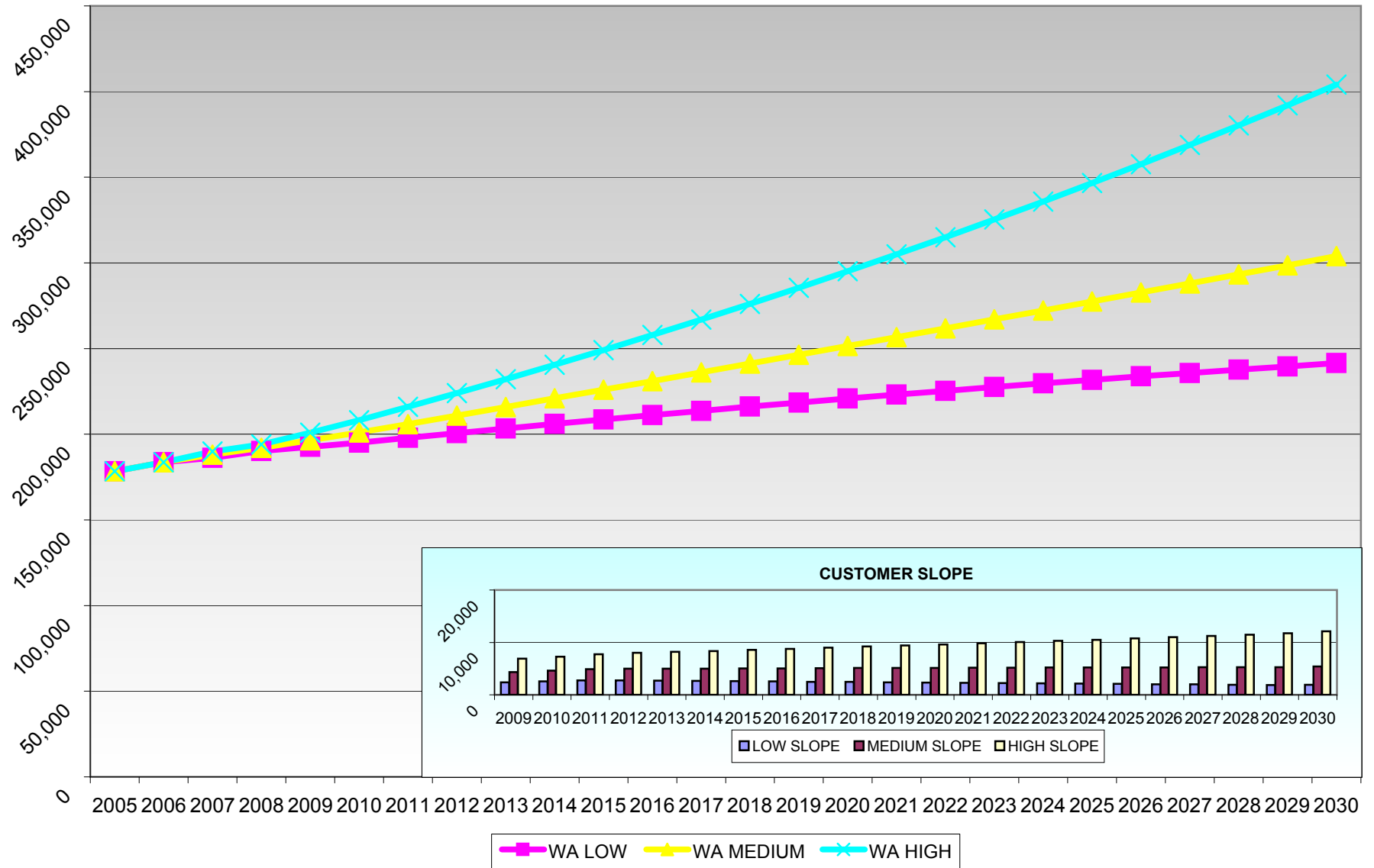
Therms

OR TOTAL THERM USAGE



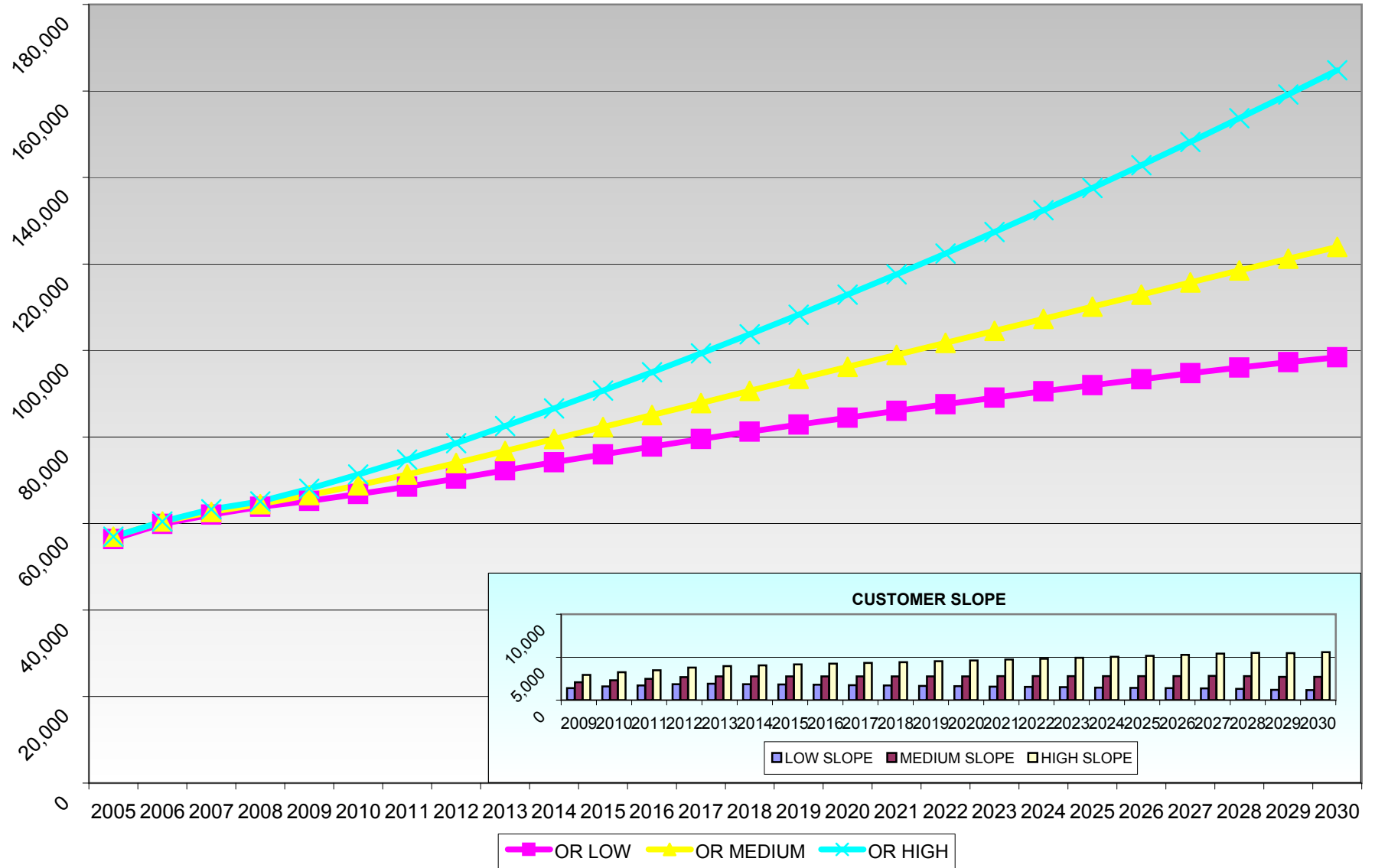
Customers

WA TOTAL CUSTOMER GROWTH



Customers

OR TOTAL CUSTOMER GROWTH



CASCADE NATURAL GAS CORPORATION
CORE DEMAND MEDIUM FORECAST SUMMARY TABLE

Table with columns for years (2009-2030) and rows for various categories (GTN, Zone 11, Zone 10, Zone 20, Zone 24, Zone 26) including Residential, Commercial, Industrial, and Total Core Customers. Includes sub-sections like 'Therms Pct. Growth' and 'Therms Per Residential Customer'.

CASCADE NATURAL GAS CORPORATION
CORE DEMAND MEDIUM FORECAST SUMMARY TABLE

Table with columns for years (2009-2030) and rows for various gas service categories (Zone 30-W, Zone 30-S, Zn ME-WA, Zn ME-OR, TOTAL WASHINGTON, TOTAL OREGON) including residential, commercial, industrial, and total core customers.

CASCADE NATURAL GAS CORPORATION
CORE DEMAND MEDIUM FORECAST SUMMARY TABLE

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Fiscal Years Ending 2008 - 2030																					
Total Core Customers	66,557	68,865	71,331	74,003	76,777	79,548	82,324	85,100	87,877	90,653	93,426	96,202	98,979	101,762	104,547	107,330	110,116	112,905	115,727	118,521	121,217	123,918
TOTAL SYSTEM																						
Total Therms Pct. Growth	1.84%	1.94%	2.11%	2.16%	2.16%	2.11%	2.08%	2.01%	2.00%	1.96%	1.91%	1.90%	1.86%	1.82%	1.78%	1.75%	1.72%	1.69%	1.67%	1.66%	1.62%	1.60%
Residential Therms	161,391,072	165,475,175	169,821,800	174,349,614	178,951,910	183,536,898	188,148,528	192,752,708	197,361,811	202,002,571	206,624,900	211,255,920	215,899,814	220,532,232	225,163,166	229,817,267	234,458,151	239,096,680	243,761,950	248,405,914	252,982,867	257,644,800
Commercial Therms	120,163,070	122,095,475	124,182,232	126,361,761	128,579,387	130,773,611	132,970,070	135,170,591	137,355,405	139,529,434	141,685,833	143,842,309	145,993,583	148,148,484	150,306,510	152,462,373	154,601,156	156,749,470	158,905,284	161,068,346	163,235,050	165,365,590
Industrial Therms	15,522,629	15,349,760	15,384,702	15,451,097	15,545,158	15,656,649	15,781,109	15,850,213	16,002,561	16,155,012	16,306,687	16,535,711	16,756,730	16,915,605	17,062,493	17,245,512	17,415,619	17,581,076	17,742,727	17,978,371	18,220,535	18,443,187
Ind., Inst., & Cmid. Interrup. Therms	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201	4,341,201
Total Core Therms	301,417,972	307,261,611	313,729,934	320,503,673	327,417,656	334,310,349	341,249,908	348,114,713	355,060,977	362,028,218	368,958,521	375,975,141	382,981,328	389,937,522	396,893,370	403,856,353	410,816,127	417,768,427	424,751,162	431,783,892	438,779,653	445,794,798
Daily BaseLoad Therms	240,828	246,074	251,817	257,871	264,059	270,225	276,465	282,660	288,914	295,221	301,502	307,799	314,108	320,389	326,684	332,989	339,302	345,615	351,984	358,393	364,791	371,197
Peak Day Therms	3,391,636	3,460,823	3,537,213	3,619,251	3,704,750	3,791,311	3,878,189	3,964,429	4,051,323	4,138,974	4,226,521	4,314,139	4,401,765	4,488,663	4,575,694	4,663,106	4,750,296	4,837,332	4,924,505	5,013,259	5,102,369	5,189,429
Therms Per Residential Customer	704	703	701	700	699	697	696	695	693	692	691	690	689	687	686	685	684	683	682	681	680	679
Therms Per Commercial Customer	3600	3594	3587	3580	3573	3567	3560	3553	3546	3540	3533	3527	3520	3514	3508	3501	3495	3489	3483	3476	3471	3465
Residential Customers	229,131	235,447	242,138	249,103	256,190	263,270	270,395	277,526	284,677	291,885	299,080	306,301	313,541	320,806	328,098	335,379	342,684	349,999	357,373	364,724	371,989	379,383
Commercial Customers	33,381	33,976	34,619	35,294	35,983	36,667	37,356	38,043	38,730	39,417	40,100	40,785	41,470	42,159	42,851	43,541	44,234	44,929	45,628	46,328	47,033	47,730
Industrial Customers	500	499	507	515	523	532	541	550	560	570	582	593	605	617	630	643	657	671	685	701	717	733
Ind., Inst., & Cmid. Interrup. Cust.	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Total Core Customers	263,027	269,939	277,280	284,927	292,712	300,484	308,307	316,135	323,983	331,888	339,777	347,695	355,632	363,599	371,594	379,579	387,590	395,615	403,702	411,770	419,755	427,862

CASCADE NATURAL GAS CORPORATION
CORE DEMAND LOW FORECAST SUMMARY TABLE

Table with columns for years 2009-2029 and rows for various zones (GTN, Zone 11, Zone 10, Zone 20, Zone 24, Zone 26) and categories (Total Core Customers, Residential Thermo, Commercial Thermo, Industrial Thermo, etc.).

CASCADE NATURAL GAS CORPORATION
CORE DEMAND LOW FORECAST SUMMARY TABLE

Fiscal Years Ending 2008 - 2030

Table with columns for years 2009-2030 and rows for various categories: Total Core Customers, Zone 30-W (Bellingham/Mt Vernon Areas), Zone 30-S (Bremerton/Grays Harbor Areas), Zone ME-WA (Walla Walla), Zone ME-OR (Pendleton), and TOTAL WASHINGTON. Each row includes numerical values and percentage changes for each year.

CASCADE NATURAL GAS CORPORATION
 CORE DEMAND LOW FORECAST SUMMARY TABLE
 Fiscal Years Ending 2008 - 2030

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Ind., Inst. & Cmt. Interrup. Cust.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	65,235	66,826	68,531	70,391	72,302	74,166	75,991	77,772	79,510	81,206	82,857	84,470	86,044	87,583	89,085	90,546	91,972	93,363	94,744	96,067	97,274	98,452
TOTAL SYSTEM																						
Total Therms Fct. Growth	0.83%	0.92%	1.09%	1.14%	1.14%	1.09%	1.06%	1.00%	0.98%	0.95%	0.90%	0.89%	0.85%	0.80%	0.77%	0.74%	0.71%	0.68%	0.66%	0.64%	0.61%	0.59%
Residential Therms	156,605,478	158,970,796	161,523,231	164,179,754	166,836,858	169,410,692	171,937,497	174,392,305	176,785,649	179,142,173	181,416,029	183,638,586	185,799,379	187,906,254	189,959,990	191,940,193	193,867,791	195,736,099	197,569,706	199,330,396	200,983,154	202,650,191
Commercial Therms	116,599,976	117,296,234	118,113,902	118,991,045	119,874,558	120,707,106	121,521,485	122,295,096	123,035,274	123,739,049	124,401,158	125,037,908	125,645,192	126,231,102	126,795,549	127,326,107	127,835,968	128,322,692	128,793,153	129,239,339	129,682,676	130,068,086
Industrial Therms	15,214,494	14,895,356	14,780,715	14,696,798	14,639,142	14,597,428	14,567,066	14,485,275	14,478,987	14,471,483	14,462,006	14,519,201	14,566,868	14,568,663	14,538,966	14,548,699	14,546,016	14,538,100	14,525,785	14,572,250	14,621,586	14,652,994
Ind., Inst. & Cmt. Interrup. Therms	4,255,025	4,212,687	4,170,770	4,129,270	4,088,183	4,047,505	4,007,232	3,967,359	3,927,883	3,888,800	3,850,106	3,811,797	3,773,869	3,736,318	3,699,141	3,662,334	3,625,893	3,589,815	3,554,096	3,518,732	3,483,720	3,449,056
Total Core Therms	292,674,974	295,375,073	298,588,618	301,996,868	305,438,741	308,762,731	312,033,280	315,140,036	318,227,793	321,241,505	324,131,298	327,007,492	329,785,308	332,432,338	334,993,646	337,477,334	339,875,668	342,186,706	344,442,740	346,660,717	348,771,136	350,820,328
Daily Baseload Therms	235,641	237,948	240,678	243,573	246,498	249,329	252,113	254,771	257,411	259,987	262,465	264,927	267,313	269,588	271,791	273,930	275,998	277,993	279,941	281,858	283,682	285,460
Peak Day Therms	3,323,236	3,355,112	3,392,804	3,432,874	3,473,342	3,512,387	3,550,891	3,587,113	3,623,233	3,658,631	3,693,292	3,728,371	3,763,364	3,798,279	3,819,186	3,848,174	3,876,151	3,903,095	3,929,293	3,955,086	3,979,696	4,003,413
Therms Per Residential Customer	697	696	694	693	692	690	689	688	686	685	684	683	682	681	679	678	677	676	675	674	673	672
Therms Per Commercial Customer	3564	3558	3551	3544	3538	3531	3524	3518	3511	3504	3498	3492	3485	3479	3473	3466	3460	3454	3448	3442	3436	3430
Residential Customers	224,582	228,477	232,632	236,942	241,259	245,459	249,593	253,627	257,573	261,467	265,247	268,948	272,566	276,107	279,572	282,933	286,219	289,421	292,578	295,625	298,513	301,417
Commercial Customers	32,718	32,970	33,260	33,571	33,885	34,186	34,482	34,767	35,043	35,309	35,563	35,811	36,051	36,285	36,513	36,732	36,945	37,152	37,355	37,551	37,743	37,921
Industrial Customers	490	485	487	490	492	496	499	503	507	511	516	521	526	531	537	542	548	555	561	568	575	582
Ind., Inst. & Cmt. Interrup. Cust.	16	16	15	15	15	15	15	15	14	14	14	14	14	14	14	13	13	13	13	13	13	
Total Core Customers	257,806	261,948	266,395	271,016	275,652	280,155	284,589	288,911	293,138	297,301	301,340	305,294	309,156	312,936	316,636	320,221	323,726	327,141	330,507	333,757	336,844	339,934

CASCADE NATURAL GAS CORPORATION
CORE DEMAND HIGH FORECAST SUMMARY TABLE

Table with columns for years 2009-2030 and rows for various gas service areas (GTN, Zone 11, Zone 10, Zone 20, Zone 24, Zone 25) including residential, commercial, and industrial thermals, and total costs.

CASCADE NATURAL GAS CORPORATION
CORE DEMAND HIGH FORECAST SUMMARY TABLE
 Fiscal Years Ending 2008 - 2030

12/15/2008

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Ind., Inst., & Cmid. Interrup. Cust.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	68,068	71,314	74,798	78,575	82,546	86,600	90,751	94,991	99,324	103,751	108,269	112,888	117,609	122,435	127,369	132,405	137,550	142,807	148,216	153,706	159,179	164,774
TOTAL SYSTEM																						
Total Therms Prot. Growth	3.12%	3.22%	3.39%	3.45%	3.44%	3.39%	3.36%	3.30%	3.28%	3.25%	3.20%	3.19%	3.15%	3.10%	3.06%	3.03%	3.00%	2.97%	2.95%	2.93%	2.90%	2.88%
Residential Therms	166,705,886	173,074,449	179,854,881	186,972,813	194,322,232	201,810,115	209,480,866	217,306,483	225,301,456	233,499,768	241,846,990	250,377,793	259,088,271	267,986,622	277,082,364	286,341,502	295,798,291	305,444,670	315,321,514	325,370,672	335,633,710	346,015,174
Commercial Therms	124,120,194	127,702,582	131,518,925	135,510,560	139,623,174	143,792,075	148,056,271	152,389,277	156,800,207	161,285,525	165,838,235	170,480,051	175,206,159	180,028,596	184,948,474	189,948,485	195,048,700	200,246,570	205,554,044	210,969,750	216,500,281	222,084,820
Industrial Therms	15,875,058	15,895,725	16,132,308	16,405,724	16,713,212	17,044,814	17,396,411	17,692,367	18,087,102	18,489,088	18,897,423	19,403,873	19,910,562	20,352,157	20,787,108	21,274,353	21,754,438	22,237,353	22,724,099	23,315,532	23,926,810	24,523,831
Ind., Inst., & Cmid. Interrup. Therms	4,439,765	4,495,610	4,552,158	4,609,417	4,667,396	4,726,105	4,785,552	4,845,747	4,906,699	4,968,417	5,030,912	5,094,194	5,158,271	5,223,154	5,288,853	5,355,378	5,422,741	5,490,950	5,560,018	5,629,955	5,700,771	5,772,478
Total Core Therms	311,140,903	321,168,365	332,058,272	343,498,515	355,326,014	367,373,109	379,719,089	392,233,874	405,095,463	418,242,798	431,613,560	445,355,911	459,363,262	473,592,528	488,106,800	502,919,718	518,024,170	533,419,544	549,159,675	565,275,909	581,661,572	598,396,304
Daily Baseload Therms	245,881	253,946	262,711	271,926	281,459	291,174	301,131	311,235	321,620	332,234	343,036	354,136	365,458	376,959	388,691	400,668	412,881	425,332	438,063	451,101	464,354	477,899
Peak Day Therms	3,467,945	3,560,698	3,703,401	3,832,479	3,965,961	4,101,866	4,241,145	4,382,696	4,526,984	4,673,152	4,825,713	4,985,570	5,138,225	5,298,422	5,461,608	5,628,531	5,798,505	5,971,704	6,148,631	6,329,853	6,514,204	6,702,167
Therms Per Residential Customer	711	710	708	707	705	704	703	701	700	699	698	697	695	694	693	692	691	690	689	688	687	686
Therms Per Commercial Customer	3636	3629	3623	3616	3609	3602	3595	3589	3582	3575	3569	3562	3556	3549	3543	3536	3530	3524	3517	3511	3505	3499
Residential Customers	234,333	243,822	253,905	264,493	275,440	286,612	298,072	309,780	321,760	334,056	346,596	359,430	372,553	385,981	399,719	413,729	428,058	442,695	457,707	472,999	488,488	504,464
Commercial Customers	34,139	35,185	36,302	37,474	38,686	39,918	41,180	42,465	43,776	45,112	46,471	47,859	49,276	50,724	52,205	53,713	55,254	56,828	58,438	60,082	61,763	63,467
Industrial Customers	511	517	532	547	562	579	596	614	633	653	674	696	719	743	767	793	820	849	878	909	941	975
Ind., Inst., & Cmid. Interrup. Cust.	16	17	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20	21	21	21	21
Total Core Customers	268,999	279,540	290,755	302,531	314,706	327,126	339,865	352,877	366,196	379,839	393,760	408,004	422,567	437,467	452,710	468,255	484,152	500,392	517,044	534,010	551,213	568,927

Appendix C

Distribution System Planning

2008 Cascade Natural Gas IRP Forecast

Estimated Reinforcement Projects

Gate Station	Town	20 year min pressure	Reinforcement Needed?	Reinforcement Needed				
				Length	Size	Type	Facilities	Year
Acme	ACME	36	no					
Arlington	ARLINGTON		yes	3740	6	HP		2008
				2120	6	PE		2011
				160	2	PE		2014
				1170	6	PE		2016
				1470	4	PE		2017
				2360	6	HP		2018
				3320	6	PE		2019
				1610	4	PE		2021
Bellingham 1	BELLINGHAM		yes				reg	2009
				6230	6	PE		2012
				1600	4	PE		2017
				2600	4	HP	reg	2020
Burbank Heights	BURBANK	29.0	no					
Castle Rock	CASTLE ROCK		no					
Deming	DEMING		no growth					
Finley	FINLEY		no					
Grandview	GRANDVIEW	0	yes	800	6	PE		2008
Kalama	KALAMA	7.0	no	1930	4	PE		2015
Kelso / South Longview	KELSO	29	no					
	LONGVIEW	18	no					
Kennewick	KENNEWICK	16	no					
	RICHLAND		yes	5910	8	HP		2010
				1600	4	PE		2011
				580	4	PE		2012
				1740	4	PE		2013
2080	4	PE		2014				
WEST RICHLAND		no						
Lawrence	LAWRENCE	35	no					
Lynden	EVERSON	22	no					
	NOOKSACK	22	no					

2008 Cascade Natural Gas IRP Forecast

Estimated Reinforcement Projects

Gate Station	Town	20 year min pressure	Reinforcement Needed?	Reinforcement Needed				
				Length	Size	Type	Facilities	Year
McCleary	ABERDEEN	29	no					
	ELMA	8	no					
	HOQUIAM	24	no					
	MCCLEARY	3	no					
	MONTESANO		yes	170	2	PE		2011
				2030	6	PE		2015
				1660	4	PE		2020
Moses Lake	MOSES LAKE	32	no					
	WHEELER		see Moses Lake					
Mount Vernon	MOUNT VERNON		yes	960	4	PE		2017
				2590	4	PE		2022
				1170	4	PE		2025
Moxee	MOXEE CITY		yes	410	2	PE		2010
Othello	OTHELLO		yes	2640	4	PE	reg	2013
Pasco / North Pasco / Burbank Heights	PASCO		yes	2600	6	PE		2008
				6660	6	PE		2010
				1120	6	PE		2017
				2030	6	PE		2023
Patterson / Plymouth	PATTERSON - PLYMOUTH		NA					
Prosser	PROSSER	35	no					
Quincy	QUINCY		no					
Sedro Woolley	ANACORTES HP		no					
	BURLINGTON	-14.7	yes	3900	6	PE		2009
				1650	4	PE		2011
				3730	6	PE		2012
				2510	6	PE		2015
				520	6	PE		2018
				560	4	PE		2020
				2100	4	PE		2021
	ANACORTES		yes	100	2	PE		2015
				720	4	PE		2018
2070				6	PE		2022	
LA CONNER	40	no						
SEDRO WOOLLEY		yes	3740	4	PE		2010	
			600	2	PE		2022	
Selah	SELAH		yes	130	2	PE		2013

2008 Cascade Natural Gas IRP Forecast

Estimated Reinforcement Projects

Gate Station	Town	20 year min pressure	Reinforcement Needed?	Reinforcement Needed				
				Length	Size	Type	Facilities	Year
Shelton	BELFAIR	24	no					
	BREMERTON		yes	400	4	PE	reg	2010
				2610	4	PE		2011
				5570	6	PE		2013
				580	2	PE		2018
				3850	6	PE		2022
	CHICO		see Silverdale					
	GORST		no growth					
	KEYPORT	35	no					
	KITSAP HP		yes	16900	12	HP		2008
				6200	12	HP		2012
				22300	12	HP		2018
	MANCHESTER		see Port Orchard					
	PORT ORCHARD		yes	890	2	PE		2008
				1150	4	PE		2011
			5960	6	HP	reg / uprate	2011	
						reg	2014	
			3660	6	PE	reg / uprate	2017	
						2020		
POULSBO		yes	2330	6	PE		2011	
			2800	4	PE		2021	
SHELTON	9.6	yes						
SILVERDALE		yes	2740	4	PE		2008	
			2750	4	PE		2013	
SUNNYSLOPE		no						
Stanwood	CAMANO ISLAND	21	no					
	OAK HARBOR		yes	1610	4	PE		2008
				2390	4	PE		2009
				3070	4	PE	reg	2013
				3120	6	PE		2017
					reg	2019		
STANWOOD	-14.7	yes				gate	2008	
				1480	6	PE	2008	
Sumas	LYNDEN	-14.7	yes	1030	4	PE		2009
				3890	4	HP		2010
				3650	4	PE		2011
				540	8	Steel		2016
				1930	4	PE		2017
				2780	4	PE		2018
				1910	4	PE		2020
				1500	4	PE		2022

2008 Cascade Natural Gas IRP Forecast

Estimated Reinforcement Projects

Gate Station	Town	20 year min pressure	Reinforcement Needed?	Reinforcement Needed						
				Length	Size	Type	Facilities	Year		
Sumas	BLAINE			3440	6	PE	5 regs / upra	2017		
				9470	6	HP		2019		
				4480	4	PE		2009		
				8500				2015		
				7080	4	PE		2021		
	FERNDALE			yes	7080	4	S	3 regs / upra	2008	
					5280	4	PE		2010	
					1600	4	PE		2010	
					1840	4	S		2011	
					5280	6	PE		2012	
					15840	4	HP		new reg	2013
					6500	6	PE		2014	
					5500	4	PE		2015	
	SUMAS		18	no						
	WHATCOM HP			no						
Sunnyside	SUNNYSIDE		yes	160	2	PE		2013		
Walla Walla	COLLEGE PLACE		yes	1500	4	HP		2010		
	WALLA WALLA		yes	330	4	PE		2008		
Wenatchee	EAST WENATCHEE		see Wenatchee							
	WENATCHEE		no							
Woodland	WOODLAND		yes	960	4	HP	reg / uprate	2009		
Yakima	UNION GAP		no							
	YAKIMA		yes	12100	8	S	reg	2008		
				11600	8	HP		2009		
8530	8	HP	reg	2010						
Zillah	GRANGER		no growth							
	TOPPENISH		42	no						
	WAPATO		no growth							
	ZILLAH		26	no						

2008 Cascade Natural Gas IRP Forecast

Estimated Reinforcement Projects

Gate Station	Town	20 year min pressure	Reinforcement Needed?	Reinforcement Needed				
				Length	Size	Type	Facilities	Year
Athena	ATHENA	29	no					
	WESTON		no growth					
Baker City	BAKER	17	no					
Bend / South Bend	BEND		yes	3680	8	S		2008
				6500	4	HP	reg / uprate	2008
				1390	6	S		2008
				17540	8	HP	reg	2009
				6780	8	HP	reg	2011
				3680	8	HP	reg / uprate	2011
				6780	8	HP	reg	2012
				2400	4	PE		2013
				4120	8	HP	reg	2013
				2300	6	PE		2015
				1340	4	PE		2017
				1200	6	PE		2019
				1990	4	PE		2020
				2380	4	PE		2027
Chemult	CHEMULT		no					
Gilchrist	CRESCENT	16	no					
	GILCHRIST	16	no					
Hermiston	HERMISTON	0	yes	4160	4	PE		2008
				2830	4	PE		2011
				1400	4	PE		2013
				620	2	PE		2020
Huntington	HUNTINGTON	39.7	no					
La Pine	LA PINE		no growth					
Madras	MADRAS	32	no					
	METOLIUS	46	yes					
Milton-Freewater	MILTON-FREEWATER		no growth					
Mission	MISSION		no growth					
Ontario	NYSSA	26.0	no					
	ONTARIO		no					
	VALE	36	no					
	ONTARIO HP		no					

2008 Cascade Natural Gas IRP Forecast

Estimated Reinforcement Projects

Gate Station	Town	20 year min pressure	Reinforcement Needed?	Reinforcement Needed				
				Length	Size	Type	Facilities	Year
Pendleton	PENDLETON		yes	4220	4	PE		2008
	PILOT ROCK		yes	1310	4	PE		2008
Prineville	PRINEVILLE		yes	2100	6	PE		2008
				700	6	PE		2022
Redmond	REDMOND		yes	1350	6	PE		2008
				2130	4	PE		2009
				2240	4	HP	reg	2011
				1460	6	PE		2013
				2030	6	PE		2014
				640	6	PE		2021
				4000'	4	HP	reg	2022
Stanfield	STANFIELD		yes	1030	2	PE		2019
Sunriver	SUNRIVER		yes	5440	6	PE		2008
				130	2	PE		2008
				2010	4	PE		2011
Umatilla	BOARDMAN		no growth					
	IRRIGON		no					
Umatilla / Hermiston	UMATILLA		no					

Appendix D-1

Oregon Residential Conservation Measures

Detailed Measure Table - OR Residential Sector Technical Potential to 2030

2030 Potential Estimated with 07/02/2008 Stellar DRAFT Study

Measure Code	Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact (\$)	Gas Savings to 2030	Level Cost, \$/th	Therms Saved/Measure
N-A105	Hi-eff Washer	New	12	27,072	(94,634)	3,389	(\$2.15)	6
N-A102	MEF 2.0 Washer	New	12	48,128	(164,326)	7,686	(\$1.63)	5
R-A102	MEF 2.0 Washer	Replace	12	1,729,147	(2,085,681)	205,694	(\$0.19)	13
R-GD111	Tank upgrade (50 gal gas) Hi Eff Alternative	Replace Gas	15	208,451	0	1,163,065	\$0.02	3,221
R-GH115	AFUE 90 to hydrocoil combo, Z 3	Retro Gas	45	718,242	0	410,848	\$0.09	172
R-GH118	AFUE 90 to hydrocoil combo, Z 4	Retro Gas	45	718,242	0	403,607	\$0.09	169
N-GH130	Heating upgrade (AFUE 90) (Z 3)	New Gas	15	586,699	0	330,358	\$0.16	84
R-GW128	Wx insulation (add walls), Z 4	Retro Gas	45	4,549,818	0	1,270,641	\$0.18	342
R-GW123	Wx insulation (add walls), Z 3	Retro Gas	45	722,019	0	191,755	\$0.19	297
R-GH125	Duct Sealing and AFUE 90+ , Z 4	Replace Gas	20	5,176,857	888,290	2,304,549	\$0.20	695
N-GH135	Heating upgrade (AFUE 90) (Z 4)	New Gas	15	586,699	0	249,039	\$0.21	63
N-GH132	HRV, E* (Gas Z 3)	New Gas	15	7,846,358	0	3,273,213	\$0.22	125
N-GH133	Ducts Indoor, DHW, Lights (Gas Z 3)	New Gas	45	21,271,770	0	4,476,757	\$0.24	163
R-GW127	Wx insulation (ceiling, floor), Z 4	Retro Gas	45	6,524,191	0	1,371,592	\$0.24	423
R-GW122	Wx insulation (ceiling, floor), Z 3	Retro Gas	45	1,013,717	0	208,425	\$0.24	389
R-GH114	Duct Sealing, Z 3	Retro Gas	20	397,540	0	107,675	\$0.28	165
N-GH137	HRV, E* (Gas Z 4)	New Gas	15	7,846,358	0	2,467,499	\$0.29	94
R-GH117	Duct Sealing, Z 4	Retro Gas	20	397,540	0	97,723	\$0.30	149
N-GH138	Ducts Indoor, DHW, Lights (Gas Z 4)	New Gas	45	21,271,770	0	3,374,786	\$0.31	123
R-GD110	Tankless Gas heater replace	Replace Gas	20	1,304,058	0	305,719	\$0.32	184
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	230,436	0	44,656	\$0.39	27
N-GH129	E* Insulation, Ducts, DHW, Lights (Gas Z 3)	New Gas	45	28,836,014	0	3,551,401	\$0.40	172
N-GH131	Window U=.3 (Gas Z 3)	New Gas	45	5,035,654	0	534,554	\$0.47	19
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	10,534,218	0	954,228	\$0.55	399
N-GH134	E* Insulation, Ducts, DHW, Lights (Gas Z 4)	New Gas	45	28,722,548	0	2,537,865	\$0.56	124
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	10,534,218	0	913,018	\$0.57	381
N-GH136	Window U=.3 (Gas Z 4)	New Gas	45	5,035,654	0	402,971	\$0.62	15
N-GH139	Tank upgrade (50 gal gas)	New Gas	15	4,502,015	0	651,638	\$0.63	29
R-GW130	Window replace (U=.35), Z 4	Replace Gas	45	561,623	0	44,032	\$0.63	26
R-A103	Estar Dishwasher	Replace	12	693,815	(178,161)	87,456	\$0.63	5
R-GW125	Window replace (U=.35), Z 3	Replace Gas	45	89,437	0	6,764	\$0.66	23
N-A103	Estar Dishwasher	New	12	12,395	(3,183)	1,477	\$0.67	5
N-GD106	Tank upgrade (50 gal gas) Hi Eff Alternative	New Gas	15	2,823,928	0	371,756	\$0.69	76
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	3,300,829	0	303,548	\$0.81	14
N-GD108	Tankless Gas heater	New Gas	20	23,323,200	0	2,097,671	\$0.83	93
R-GD113	Solar hot water heater (50 gal) - With gas backup.	Replace Gas	20	2,228,225	0	179,409	\$0.93	518
R-GW129	Window, retro (U=.35), Z 4	Retro Gas	45	19,728,016	0	965,743	\$1.01	209
R-GW124	Window, retro (U=.35), Z 3	Retro Gas	45	3,498,078	0	165,563	\$1.05	185
R-GW131	HRV, Z 4	Retro Gas	18	6,196,735	2,088,467	277,542	\$2.39	86
R-GW126	HRV, Z 3	Retro Gas	18	962,955	345,165	42,401	\$2.47	80
N-GD107	Solar hot water heater (50 gal) - With gas backup.	New Gas	20	63,345,619	0	1,150,458	\$4.11	115
R-GH124	AFUE 90+ Furnace, Z 4	Replace Gas	18	4,767,880	2,413,451	115,904	\$4.96	7
R-GH122	AFUE 90+ Furnace, Z 3	Replace Gas	18	4,767,880	2,413,451	72,360	\$7.95	4
R-GH123	Duct Sealing and AFUE 90+ , Z 3	Replace Gas	20	5,176,857	888,290	45,431	\$9.97	14

At an \$1.00/therm leveled cost screen, cumulative therm savings equals 34,906,461.

New Measures in 2008:

Measure Code	Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact (\$)	Gas Savings to 2030
N-A102	MEF 2.0 Washer	New	12	48,128	(164,326)	7,686
N-A103	Estar Dishwasher	New	12	12,395	(3,183)	1,477
N-A105	Hi-eff Washer	New	12	27,072	(94,634)	3,389
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	3,300,829	0	303,548
N-GH129	E* Insulation, Ducts, DHW, Lights (Gas Z 3)	New Gas	45	28,836,014	0	3,551,401
N-GH133	Ducts Indoor, DHW, Lights (Gas Z 3)	New Gas	45	21,271,770	0	4,476,757
N-GH138	Ducts Indoor, DHW, Lights (Gas Z 4)	New Gas	45	21,271,770	0	3,374,786
R-A102	MEF 2.0 Washer	Replace	12	1,729,147	(2,085,681)	205,694
R-A103	Estar Dishwasher	Replace	12	693,815	(178,161)	87,456
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	230,436	0	44,656
R-GD113	Solar hot water heater (50 gal) - With gas backup.	Replace Gas	20	2,228,225	0	179,409
R-GH115	AFUE 90 to hydrocoil combo, Z 3	Retro Gas	45	718,242	0	410,848
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	10,534,218	0	954,228
R-GH118	AFUE 90 to hydrocoil combo, Z 4	Retro Gas	45	718,242	0	403,607
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	10,534,218	0	913,018

Appendix D-2

Oregon Commercial/Industrial Conservation Measures

Detailed Measure Table - OR Residential Sector Technical Potential to 2030

2030 Potential Estimated with 07/02/2008 Stellar DRAFT Study

Measure Code	Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact (\$)	Gas Savings to 2030	Level Cost, \$/th	Therms Saved/Measure
N-A105	Hi-eff Washer	New	12	27,072	(94,634)	3,389	(\$2.15)	6
N-A102	MEF 2.0 Washer	New	12	48,128	(164,326)	7,686	(\$1.63)	5
R-A102	MEF 2.0 Washer	Replace	12	1,729,147	(2,085,681)	205,694	(\$0.19)	13
R-GD111	Tank upgrade (50 gal gas) Hi Eff Alternative	Replace Gas	15	208,451	0	1,163,065	\$0.02	3,221
R-GH115	AFUE 90 to hydrocoil combo, Z 3	Retro Gas	45	718,242	0	410,848	\$0.09	172
R-GH118	AFUE 90 to hydrocoil combo, Z 4	Retro Gas	45	718,242	0	403,607	\$0.09	169
N-GH130	Heating upgrade (AFUE 90) (Z 3)	New Gas	15	586,699	0	330,358	\$0.16	84
R-GW128	Wx insulation (add walls), Z 4	Retro Gas	45	4,549,818	0	1,270,641	\$0.18	342
R-GW123	Wx insulation (add walls), Z 3	Retro Gas	45	722,019	0	191,755	\$0.19	297
R-GH125	Duct Sealing and AFUE 90+ , Z 4	Replace Gas	20	5,176,857	888,290	2,304,549	\$0.20	695
N-GH135	Heating upgrade (AFUE 90) (Z 4)	New Gas	15	586,699	0	249,039	\$0.21	63
N-GH132	HRV, E* (Gas Z 3)	New Gas	15	7,846,358	0	3,273,213	\$0.22	125
N-GH133	Ducts Indoor, DHW, Lights (Gas Z 3)	New Gas	45	21,271,770	0	4,476,757	\$0.24	163
R-GW127	Wx insulation (ceiling, floor), Z 4	Retro Gas	45	6,524,191	0	1,371,592	\$0.24	423
R-GW122	Wx insulation (ceiling, floor), Z 3	Retro Gas	45	1,013,717	0	208,425	\$0.24	389
R-GH114	Duct Sealing, Z 3	Retro Gas	20	397,540	0	107,675	\$0.28	165
N-GH137	HRV, E* (Gas Z 4)	New Gas	15	7,846,358	0	2,467,499	\$0.29	94
R-GH117	Duct Sealing, Z 4	Retro Gas	20	397,540	0	97,723	\$0.30	149
N-GH138	Ducts Indoor, DHW, Lights (Gas Z 4)	New Gas	45	21,271,770	0	3,374,786	\$0.31	123
R-GD110	Tankless Gas heater replace	Replace Gas	20	1,304,058	0	305,719	\$0.32	184
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	230,436	0	44,656	\$0.39	27
N-GH129	E* Insulation, Ducts, DHW, Lights (Gas Z 3)	New Gas	45	28,836,014	0	3,551,401	\$0.40	172
N-GH131	Window U=.3 (Gas Z 3)	New Gas	45	5,035,654	0	534,554	\$0.47	19
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	10,534,218	0	954,228	\$0.55	399
N-GH134	E* Insulation, Ducts, DHW, Lights (Gas Z 4)	New Gas	45	28,722,548	0	2,537,865	\$0.56	124
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	10,534,218	0	913,018	\$0.57	381
N-GH136	Window U=.3 (Gas Z 4)	New Gas	45	5,035,654	0	402,971	\$0.62	15
N-GH139	Tank upgrade (50 gal gas)	New Gas	15	4,502,015	0	651,638	\$0.63	29
R-GW130	Window replace (U=.35), Z 4	Replace Gas	45	561,623	0	44,032	\$0.63	26
R-A103	Estar Dishwasher	Replace	12	693,815	(178,161)	87,456	\$0.63	5
R-GW125	Window replace (U=.35), Z 3	Replace Gas	45	89,437	0	6,764	\$0.66	23
N-A103	Estar Dishwasher	New	12	12,395	(3,183)	1,477	\$0.67	5
N-GD106	Tank upgrade (50 gal gas) Hi Eff Alternative	New Gas	15	2,823,928	0	371,756	\$0.69	76
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	3,300,829	0	303,548	\$0.81	14
N-GD108	Tankless Gas heater	New Gas	20	23,323,200	0	2,097,671	\$0.83	93
R-GD113	Solar hot water heater (50 gal) - With gas backup.	Replace Gas	20	2,228,225	0	179,409	\$0.93	518
R-GW129	Window, retro (U=.35), Z 4	Retro Gas	45	19,728,016	0	965,743	\$1.01	209
R-GW124	Window, retro (U=.35), Z 3	Retro Gas	45	3,498,078	0	165,563	\$1.05	185
R-GW131	HRV, Z 4	Retro Gas	18	6,196,735	2,088,467	277,542	\$2.39	86
R-GW126	HRV, Z 3	Retro Gas	18	962,955	345,165	42,401	\$2.47	80
N-GD107	Solar hot water heater (50 gal) - With gas backup.	New Gas	20	63,345,619	0	1,150,458	\$4.11	115
R-GH124	AFUE 90+ Furnace, Z 4	Replace Gas	18	4,767,880	2,413,451	115,904	\$4.96	7
R-GH122	AFUE 90+ Furnace, Z 3	Replace Gas	18	4,767,880	2,413,451	72,360	\$7.95	4
R-GH123	Duct Sealing and AFUE 90+ , Z 3	Replace Gas	20	5,176,857	888,290	45,431	\$9.97	14

At an \$1.00/therm levelized cost screen, cumulative therm savings equals 34,906,461.

New Measures in 2008:

Measure Code	Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact (\$)	Gas Savings to 2030
N-A102	MEF 2.0 Washer	New	12	48,128	(164,326)	7,686
N-A103	Estar Dishwasher	New	12	12,395	(3,183)	1,477
N-A105	Hi-eff Washer	New	12	27,072	(94,634)	3,389
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	3,300,829	0	303,548
N-GH129	E* Insulation, Ducts, DHW, Lights (Gas Z 3)	New Gas	45	28,836,014	0	3,551,401
N-GH133	Ducts Indoor, DHW, Lights (Gas Z 3)	New Gas	45	21,271,770	0	4,476,757
N-GH138	Ducts Indoor, DHW, Lights (Gas Z 4)	New Gas	45	21,271,770	0	3,374,786
R-A102	MEF 2.0 Washer	Replace	12	1,729,147	(2,085,681)	205,694
R-A103	Estar Dishwasher	Replace	12	693,815	(178,161)	87,456
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	230,436	0	44,656
R-GD113	Solar hot water heater (50 gal) - With gas backup.	Replace Gas	20	2,228,225	0	179,409
R-GH115	AFUE 90 to hydrocoil combo, Z 3	Retro Gas	45	718,242	0	410,848
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	10,534,218	0	954,228
R-GH118	AFUE 90 to hydrocoil combo, Z 4	Retro Gas	45	718,242	0	403,607
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	10,534,218	0	913,018

Appendix D-3

Washington Residential Conservation Measures

Detailed Measure Table - WA Residential Sector Technical Potential to 2030

Measure Code	Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact (\$)	Gas Savings to 2030	Gas Savings to 2025	Level Cost, \$/th	Therms Saved/Measure	Implied No. of Units
N-A105	Hi-eff Washer	New	12	27,072	(94,634)	3,389	-	(\$2.15)	4	847
N-A102	MEF 2.0 Washer	New	12	48,128	(164,326)	26,566	-	(\$1.63)	3	8,855
R-A102	MEF 2.0 Washer	Replace	12	1,729,147	(2,085,681)	711,016	-	(\$0.19)	6	118,503
R-WG106	Wx insulation 1 added measure Zone 3	WxExist	45	1,209,659	0	500,847	467,920	\$0.12	367	1,363
R-WG104	Wx insulation 1 added measure Zone 1	WxExist	45	815,862	0	295,663	276,226	\$0.14	323	915
R-WG105	Wx insulation 1 added measure Zone 2	WxExist	45	1,645,785	0	577,721	539,741	\$0.14	314	1,842
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	230,436	0	154,360	-	\$0.39	14	11,026
N-H103	E* Insulation, Ducts, Zone 3	NewPkg	45	25,482,056	0	3,955,216	3,488,895	\$0.41	126	31,391
R-WG109	Window, replacement (U=.35) Zone 3	WxExist	45	11,141,516	0	1,291,204	1,206,318	\$0.43	544	2,375
R-H115	Duct Sealing and AFUE 90+, Zone 3	HVACExist	20	1,816,350	0	305,125	225,677	\$0.44	210	1,450
R-WG107	Window, replacement (U=.35) Zone 1	WxExist	45	7,514,462	0	759,124	709,217	\$0.49	475	1,598
N-H102	E* Insulation, Ducts, Zone 2	NewPkg	45	34,669,244	0	4,342,203	3,830,256	\$0.50	102	42,696
R-WG108	Window, replacement (U=.35) Zone 2	WxExist	45	15,158,429	0	1,472,717	1,375,897	\$0.51	457	3,220
R-WG103	Wx insulation 2 measures Zone 3	WxExist	45	8,467,615	0	820,810	766,849	\$0.51	258	3,178
N-H105	Heating upgrade (AFUE 90), Zone 2	NewPkg	18	9,261,207	0	1,811,898	1,598,275	\$0.52	81	22,369
R-H103	Duct Sealing, Zone 3	HVACExist	20	1,597,557	0	226,742	167,703	\$0.53	113	1,999
R-H113	Duct Sealing and AFUE 90+, Zone 1	HVACExist	20	1,225,048	0	168,839	124,877	\$0.54	173	977
N-H101	E* Insulation, Ducts, Zone 1	NewPkg	45	17,186,524	0	2,001,279	1,765,328	\$0.54	95	21,178
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	10,534,218	0	3,298,452	-	\$0.55	399	8,267
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	10,534,218	0	3,156,002	-	\$0.57	381	8,283
R-WG101	Wx insulation 2 measures Zone 1	WxExist	45	5,711,033	0	486,530	454,544	\$0.58	228	2,131
R-H114	Duct Sealing and AFUE 90+, Zone 2	HVACExist	20	2,471,209	0	316,149	233,830	\$0.58	160	1,971
R-WG102	Wx insulation 2 measures Zone 2	WxExist	45	11,520,492	0	951,120	888,592	\$0.60	222	4,287
R-A103	Estar Dishwasher	Replace	12	693,815	-178,161	302,308	-	\$0.63	2	151,154
N-H115	E* Plus (FTC) Insulation, Zone 3	NewPkg	45	41,873,733	0	4,143,104	3,654,631	\$0.64	296	13,992
N-H106	Heating upgrade (AFUE 90), Zone 3	NewPkg	18	6,807,030	0	1,079,008	951,793	\$0.64	65	16,651
R-H106	AFUE 90+ Furnace, Zone 3	HVACExist	18	15,206,583	0	1,859,161	1,375,074	\$0.66	99	18,853
N-A103	Estar Dishwasher	New	12	12,395	-3,183	5,105	-	\$0.67	3	1,702
R-H101	Duct Sealing, Zone 1	HVACExist	20	1,077,482	0	117,936	87,228	\$0.68	88	1,348
N-H104	Heating upgrade (AFUE 90), Zone 1	NewPkg	18	4,591,042	0	681,235	600,917	\$0.69	61	11,131
R-H112	Combo with Hot Water delivery, Zone 3	HVACExist	30	346,713	0	28,301	20,932	\$0.72	327	87
R-H102	Duct Sealing, Zone 2	HVACExist	20	2,173,533	0	209,331	154,826	\$0.78	77	2,719
R-H110	Combo with Hot Water delivery, Zone 1	HVACExist	30	233,842	0	17,378	12,853	\$0.79	297	58
R-H104	AFUE 90+ Furnace, Zone 1	HVACExist	18	10,256,171	0	1,031,683	763,055	\$0.80	81	12,704
N-H114	E* Plus (FTC) Insulation, Zone 2	NewPkg	45	56,970,705	0	4,469,564	3,942,601	\$0.81	235	19,028
N-H112	HRV, E*, Zone 3	NewPkg	45	11,343,160	0	889,527	784,651	\$0.81	94	9,503
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	3,300,829	0	1,049,264	-	\$0.81	14	74,947
R-H111	Combo with Hot Water delivery, Zone 2	HVACExist	30	471,715	0	33,944	25,105	\$0.82	288	118
N-H113	E* Plus (FTC) Insulation, Zone 1	NewPkg	45	28,241,989	0	2,080,009	1,834,776	\$0.86	221	9,433
R-H105	AFUE 90+ Furnace, Zone 2	HVACExist	18	20,689,098	0	1,925,599	1,424,214	\$0.86	75	25,617

\$0.85/therm screen

R-WG112	Window upgrade (U=.4 to U=.35) Zone 3	WxExist	45	866,562	0	48,408	45,226	\$0.89	20	2,412	
N-H111	HRV, E*, Zone 2	NewPkg	45	15,432,773	0	1,044,239	921,123	\$0.93	81	12,892	
N-H110	HRV, E*, Zone 1	NewPkg	45	7,650,462	0	489,198	431,521	\$0.99	77	6,395	
N-H109	Window U=.3, Zone 3	NewPkg	45	10,250,131	0	647,942	571,549	\$1.00	36	17,998	\$1.00/therm screen
R-WG110	Window upgrade (U=.4 to U=.35) Zone 1	WxExist	45	584,458	0	28,050	26,206	\$1.03	17	1,623	
R-WG111	Window upgrade (U=.4 to U=.35) Zone 2	WxExist	45	1,178,989	0	55,294	51,659	\$1.06	17	3,264	
N-H108	Window U=.3, Zone 2	NewPkg	45	13,945,668	0	769,574	678,841	\$1.15	32	24,431	
N-H107	Window U=.3, Zone 1	NewPkg	45	6,913,262	0	349,465	308,263	\$1.25	29	12,134	
N-DG104	Tankless Gas heater	NewDHW	20	6,464,131	0	429,473	378,838	\$1.43	43	10,054	
R-DG104	Tankless Gas heater	DHWExist	20	6,764,911	0	352,691	329,504	\$1.43	43	8,257	
R-H109	AFUE 85 DHW combo, Zone 3	HVACExist	18	3,451,075	0	184,920	136,771	\$1.49	115	1,605	
R-H107	AFUE 85 DHW combo, Zone 1	HVACExist	18	2,327,598	0	118,189	87,415	\$1.58	109	1,083	
R-H108	AFUE 85 DHW combo, Zone 2	HVACExist	18	4,695,310	0	221,571	163,878	\$1.70	101	2,184	
R-WG115	HRV Zone 3	WxExist	18	2,785,379	0	106,303	99,315	\$2.10	74	1,439	
R-WG113	HRV Zone 1	WxExist	18	1,878,615	0	62,527	58,417	\$2.41	65	959	
N-DG101	Tank upgrade (50 gal gas)	NewDHW	15	19,434,016	0	928,774	819,271	\$2.43	13	70,760	
R-DG101	Tank upgrade (50 gal gas)	DHWExist	15	20,338,292	0	762,726	712,583	\$2.43	13	58,109	
R-WG114	HRV Zone 2	WxExist	18	3,789,607	0	121,458	113,473	\$2.50	63	1,922	
N-DG103	Solar hot water heater (50 gal) - Solar Zone 2. With gas backup.	NewDHW	20	31,102,639	0	1,107,347	976,790	\$2.67	113	9,827	
R-DG103	Solar hot water heater (50 gal) - Solar Zone 2. With gas backup.	DHWExist	20	32,549,863	0	909,374	849,590	\$2.67	113	8,070	
R-DG102	Tank upgrade (50 gal gas) condensing	DHWExist	15	30,462,969	0	807,134	754,072	\$3.44	66	12,185	
N-DG102	Tank upgrade (50 gal gas) condensing	NewDHW	15	29,108,533	0	982,850	866,971	\$3.44	66	14,838	

At an \$0.85/therm levelized cost screen, cumulative therm savings equals 43,549,821.

At an \$1.00/therm levelized cost screen, cumulative therm savings equals 49,785,217.

New Measures in 2008:

Measure Code	Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact (\$)	Gas Savings to 2030	Level Cost, \$/th	Therms Saved/Measure
N-A102	MEF 2.0 Washer	New	12	48,128	(164,326)	26,566	(\$1.63)	3
N-A103	Estar Dishwasher	New	12	12,395	(3,183)	5,105	\$0.67	3
N-A105	Hi-eff Washer	New	12	27,072	(94,634)	3,389	(\$2.15)	4
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	3,300,829	0	1,049,264	\$0.81	14
R-A102	MEF 2.0 Washer	Replace	12	1,729,147	(2,085,681)	711,016	(\$0.19)	6
R-A103	Estar Dishwasher	Replace	12	693,815	(178,161)	302,308	\$0.63	2
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	230,436	0	154,360	\$0.39	14
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	10,534,218	0	3,298,452	\$0.55	399
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	10,534,218	0	3,156,002	\$0.57	381

Appendix D-4

Washington Commercial/Industrial Conservation Measures

Detailed Measure Table - WA Commercial Sector Technical Potential to 2030

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Gas Savings to 2030 (000's)	Gas Savings to 2025 (000's)	Levelized Cost, \$/kWh	Levelized Cost, \$/th	Therms Saved/Measure (000's)	Implied No. of Units
W123r	HiEff Clothes Washer	Install high performance commercial clothes washers - residential sized units	At Replacement	Water Heat	203	182	na	(\$0.30)	0.078	2,618
W123	HiEff Clothes Washer	Install high performance commercial clothes washers - residential sized units	New	Water Heat	73	51	(\$0.02)	(\$0.30)	0.078	947
E114	Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: Old buildings	At Replacement	Heating	1,217	528	\$0.00	\$0.03	3.352	363
R101	Heat Reclaim with Floating Head Control	Large Grocery - Heat recovery to space heating with floating head control	New	Refrigeration	7,937	5,471	\$0.00	\$0.03	25.409	312
R101rep	Heat Reclaim with Floating Head Control	Large Grocery - Heat recovery to space heating with floating head control	At Replacement	Refrigeration	13,443	11,926	\$0.00	\$0.03	25.409	529
E115	Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: Old buildings	At Replacement	Heating	1,806	879	\$0.00	\$0.04	4.559	396
C116rep	Estar Steam Cooker	Install Energy Star Steam Cooker	At Replacement	Cooking	472	424	na	\$0.04	0.295	1,599
C116	Estar Steam Cooker	Install Energy Star Steam Cooker	New	Cooking	179	125	na	\$0.04	0.295	605
E121	Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: Old buildings	At Replacement	Heating	572	295	\$0.00	\$0.06	1.854	308
E123	Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: New Construction	New	Heating	666	200	\$0.00	\$0.06	2.657	251
E101	Wall Insulation - Blown R11	Wall Insulation - Blown R11. Application: Old buildings	Retrofit	Heating	1,945	1,981	\$0.00	\$0.07	7.412	262
E111	Roof Insulation - Attic R0-30	Roof Insulation - Attic R0-30. Application: Buildings with uninsulated attics	Retrofit	Heating	138	121	\$0.00	\$0.07	3.769	37
E124	Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: New Construction	New	Heating	890	277	\$0.01	\$0.08	3.647	244
C112	Infrared Fryer		New	Cooking	705	494	na	\$0.09	0.421	1,672
C107	Infrared Fryer		At Replacement	Cooking	2,279	2,051	na	\$0.09	0.421	5,407
M105r	Solar Pool Heaters	Install solar pool heaters in public, educational and other swimming pool	Retrofit	Misc.	210	215	na	\$0.09	0.017	12,300
H105	HW Boiler Tune	Tune up in accordance with Minneapolis Energy Office protocol. Can include derating the burner, adjusting the secondary air, adding flue restrictors, cleaning the fire-side of the heat exchanger, cleaning the water side, or installing turbulators. Other modifications may include uprating the burner to reduce oxygen or derating the burner to reduce stack temperature. Note: In gas systems, excess air and stack temperatures are often within reasonable ranges, so the technical potential for this measure is limited. Combining this measure with the vent damper and power burner measures increases both applicability and cost effectiveness, and was assumed for this analysis.	Retrofit	Heating	9	9	na	\$0.09	0.388	22
H104	Hot Water Temperature Reset	Controller automatically resets the delivery temperature in a hot water radiant system based on outside air temperature. The reset reduces the on-time of the heating equipment and the occurrence of simultaneous heating and cooling through instantaneous adjustments.	Retrofit	Heating	424	284	na	\$0.11	0.705	602
E130	Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: New Construction	New	Heating	299	102	\$0.01	\$0.11	1.463	205
E122	Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: Old buildings	At Replacement	Heating	1,171	696	\$0.01	\$0.11	3.096	378
E103	Roof Insulation - Rigid R0-11	Roof Insulation - Rigid R0-11-not including re-roofing costs but including deck preparation. Application: Old buildings with flat roofs and no attics	At Replacement	Heating	491	418	\$0.01	\$0.13	4.576	107
E102	Wall Insulation - Spray On for Metal Buildings	Wall Insulation - Spray On for Metal Buildings (Cellulose) Unfinished. Application: Old buildings	Retrofit	Heating	318	324	\$0.00	\$0.15	3.287	97
E116	Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: Old buildings	At Replacement	Heating	2,218	1,645	\$0.00	\$0.16	1.206	1,840
H106	Steam Balance	Single-pipe steam systems are notorious for uneven heating, which wastes energy because the thermostat must be set to heat the coldest spaces and overheating other spaces. Steam balances corrects these problems by: 1) Adding air venting on the main line or at the radiators; 2) Adding boiler cycle controls; 3) Adding or subtracting radiators. Energy savings accrue from lowering the overall building temperature.	Retrofit	Heating	178	149	na	\$0.17	0.769	231
W127r	Waste Water Heat Exchanger	Install HX on waste water	Retrofit	Water Heat	74	76	na	\$0.17	0.000	0
E125	Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: New Construction	New	Heating	989	527	\$0.00	\$0.17	0.991	998
C111	Direct Fired Convection Oven		New	Cooking	200	140	na	\$0.18	0.522	384
C106	Direct Fired Convection Oven		At Replacement	Cooking	448	402	na	\$0.18	0.522	858

Detailed Measure Table - WA Commercial Sector Technical Potential to 2030

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Gas Savings to 2030 (000's)	Gas Savings to 2025 (000's)	Levelized Cost, \$/kWh	Levelized Cost, \$/th	Therms Saved/Measure (000's)	Implied No. of Units
E131	Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: New Construction	New	Heating	549	219	\$0.01	\$0.19	2.494	220
E104	Roof Insulation - Rigid R0-22	Roof Insulation - Rigid R0-22-- not including re-roofing costs but including deck preparation and ~4" rigid.. Application: Old buildings with flat roofs and no attics	At Replacement	Heating	560	477	\$0.01	\$0.20	5.205	108
W101	DHW Wrap	Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.	Retrofit	Water Heat	27	25	na	\$0.20	0.076	358
H119	HiEff Unit Heater (new)	Install power draft units (80% seas. Eff) inplace of natural draft (64% seas. Eff)	New	Heating	510	270	na	\$0.20	1.595	320
E118	Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: Old buildings	At Replacement	Heating	1,874	1,464	\$0.00	\$0.20	2.073	904
E127	Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: New Construction	New	Heating	1,114	673	\$0.00	\$0.21	1.913	582
E119	Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: Old buildings	At Replacement	Heating	1,397	921	\$0.02	\$0.22	3.227	433
W102	DHW Shower Heads	Install low flow shower heads (2.0 gallons per minute) to replace 3.4 GPM shower heads.	Retrofit	Water Heat	131	134	na	\$0.22	0.069	1,887
H114	Hi Eff Unit Heater (replace)	Install power draft units (80% seas. Eff) inplace of natural draft (64% seas. Eff)	At Replacement	Heating	897	607	na	\$0.24	1.595	563
M105	Solar Pool Heaters	Install solar pool heaters in public, educational and other swimming pool	New	Misc.	46	32	na	\$0.24	0.017	2,710
E107	Roof Insulation - Blanket R0-19	Roof Insulation - Blanket R0-19. Application: Buildings with open truss unfinished interior	Retrofit	Heating	297	303	\$0.02	\$0.27	3.275	91
E112	Roof Insulation - Attic 11-30	Roof Insulation - Attic 11-30. Application: Buildings with partially insulated attics	Retrofit	Heating	211	215	\$0.02	\$0.28	1.409	150
E108	Roof Insulation - Blanket R0-30	Roof Insulation - Blanket R0-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	312	318	\$0.02	\$0.29	2.303	135
W124r	Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	Retrofit	Water Heat	160	163	na	\$0.31	0.000	0
E105	Roof Insulation - Rigid R11-22	Roof Insulation - Rigid R11-22 2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs, no attics, and some insulation	At Replacement	Heating	1,107	905	\$0.02	\$0.33	1.814	610
E117	Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: Old buildings	At Replacement	Heating	735	593	\$0.00	\$0.34	0.750	980
E128	Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: New Construction	New	Heating	1,688	1,016	\$0.00	\$0.35	2.921	578
H107	Vent Damper	Install vent damper downstream of the draft relief to prevent airflow up the stack, while allowing warm air from the boiler to spill into the conditioned space as heat or into the boiler room to reduce jacket losses. This measure is most cost-effective when combined with the boiler tune up and power burner measures.	Retrofit	Heating	47	40	na	\$0.36	0.388	121
W121	Combo Hieff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	New	Heating	87	60	na	\$0.36	0.379	231
E113	Roof Insulation - Roofcut 0-22	Roof Insulation - Roofcut 0-22. Application: Buildings with uninsulated flat roofs at reroofing time	At Replacement	Heating	2	2	\$0.02	\$0.37	1.883	1
E126	Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: New Construction	New	Heating	412	251	\$0.00	\$0.37	0.689	597
H101	Warm Up Control	This measure is designed to implement a shut down of outside air when the building is coming off night setback. Usualy the capability for this is available in a commercial t-stat but either the extra control wire is not attached or the unit itself has not been set up to receive the signal. Cost is based on labor cost to enable this ability in existing controllers	Retrofit	Heating	275	280	na	\$0.38	0.187	1,474
W119	Combo Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	At Replacement	Heating	136	120	na	\$0.39	0.379	359
C113	Convection Range/Oven	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	New	Cooking	43	30	na	\$0.39	0.149	290
H117	SPC Hieff Boiler (new)	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	New	Heating	245	117	na	\$0.39	0.681	360
C108	Convection Range/Oven	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	At Replacement	Cooking	95	86	na	\$0.40	0.149	638
W103	DHW Faucets	Add aerators to existing faucets to reduce flow from 3.4 gallons per minute to 2.0 GPM.	Retrofit	Water Heat	17	18	na	\$0.41	0.014	1,258
H111	SPC Hieff Boiler Replace	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	At Replacement	Heating	77	47	na	\$0.46	0.681	114
C115	Power Range Burner	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	New	Cooking	129	90	na	\$0.47	0.121	1,067
C110	Power Range Burner	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	At Replacement	Cooking	282	253	na	\$0.47	0.121	2,337

Detailed Measure Table - WA Commercial Sector Technical Potential to 2030

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Gas Savings to 2030 (000's)	Gas Savings to 2025 (000's)	Levelized Cost, \$/kWh	Levelized Cost, \$/th	Therms Saved/Measure (000's)	Implied No. of Units	
H102	DCV	Applicable to single zone packaged systems with large make-up air fractions either because of intermittent occupancy or because of code requirements. In most cases the outdoor air is reset to 5% or less with CO2 build-up modulating ventilation.	Retrofit	Heating	364	287	\$0.05	\$0.62	0.495	735	
H120a	Cond Unit Heater from Nat Draft(new)	Install condensing power draft units (90% seas. Eff) in place of natural draft (64% seas. Eff)	New	Heating	884	468	na	\$0.63	2.304	384	
H118	SPC Cond Boiler (new)	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	New	Heating	457	219	na	\$0.65	1.178	388	
W109	DHW Condensing Tank (new)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	New	Water Heat	280	176	na	\$0.67	0.357	784	
C114	Infrared Griddle		New	Cooking	93	65	na	\$0.67	0.211	439	
W108	DHW Condensing Tank (repl)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	At Replacement	Water Heat	415	331	na	\$0.68	0.357	1,163	
W115	DHW Hieff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	New	Water Heat	93	59	na	\$0.68	0.160	583	
C109	Infrared Griddle		At Replacement	Cooking	205	184	na	\$0.68	0.211	971	
W113	DHW Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	At Replacement	Water Heat	132	106	na	\$0.69	0.160	826	
W127	Waste Water Heat Exchanger	Install HX on waste water	New	Water Heat	132	91	na	\$0.70	0.000	0	
W122	Combo Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	New	Heating	171	117	na	\$0.72	0.739	231	
H108	Power burner	Replace standard burner with a power burner to optimize combustion and reduce standby losses in the stack. Note: Costs and savings assume that this measure will be performed in conjunction with a boiler tune up when appropriate.	Retrofit	Heating	483	410	na	\$0.72	0.572	844	
H115a	Cond Unit Heater from Nat draft(replace)	Install condensing power draft units (90% seas. Eff) in place of natural draft (64% seas. Eff)	At Replacement	Heating	1,555	1,053	na	\$0.74	2.304	675	
H112	SPC Cond Boiler Replace	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	At Replacement	Heating	145	88	na	\$0.76	1.178	123	
W104	DHW Pipe Ins	Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.	Retrofit	Water Heat	39	40	na	\$0.77	0.014	2,817	
W120	Combo Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	At Replacement	Heating	266	235	na	\$0.78	0.739	359	\$0.85/therm screen
W105	DHW Recirc Controls	Install electronic controller to hot water boiler system that turns off the boiler and circulation pump when the hot water demand is reduced (usually in residential type occupancies) or can be reset to meet the hot water load. (Steel boilers also require a mixing valve to prevent water temperatures from dropping below required levels).	Retrofit	Water Heat	99	101	na	\$0.96	0.042	2,331	
H123	HVAC controls	Control set up and algorithm. This assumes the development of an open source control package aimed at describing scheduling and control points throughout the HVAC system, property training operators so that scheduling can be maintained and adjusted as needed, and providing operator back up so that temperature reset, pressure reset, and minimum damper settings are set at optimum levels for the current occupancy.	New	Heating	2,417	1,426	\$0.08	\$0.99	0.957	2,526	\$1.00/therm screen
H103	Ducts	Duct retrofit of both insulation and air sealing	Retrofit	Heating	146	126	\$0.09	\$1.04	0.776	188	
W124	Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	New	Water Heat	35	24	na	\$1.04	0.000	0	
W116	DHW Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	New	Water Heat	182	116	na	\$1.08	0.311	583	
W114	DHW Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	At Replacement	Water Heat	257	208	na	\$1.13	0.311	826	

Detailed Measure Table - WA Commercial Sector Technical Potential to 2030

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Gas Savings to 2030 (000's)	Gas Savings to 2025 (000's)	Levelized Cost, \$/kWh	Levelized Cost, \$/th	Therms Saved/Measure (000's)	Implied No. of Units
E106	Roof Insulation - Rigid R11-33	Roof Insulation - Rigid R11-33: add 4" of insulation at reroof. Application: Old buildings with flat roofs, no attics, and some insulation	At Replacement	Heating	415	331	\$0.07	\$1.13	0.917	453
H120b	Cond Unit Heater From Power Draft (new)	Install condensing power draft units (90% seas. Eff) in place of power draft (80% seas. Eff)	New	Heating	226	120	na	\$1.27	0.885	256
W125r	Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	Retrofit	Water Heat	686	701	na	\$1.45	1.318	521
H121	Cond Furnace (new)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.	New	Heating	400	237	na	\$1.45	1.063	376
H129	Steam Trap Maintenance	Set up a in-house steam trap maintenance program with equipment, training, and trap replacement. An alternative procedure is to just pay for an outside contractor to conduct a steam survey.	Retrofit	Heating	201	168	na	\$1.46	1.086	185
H115b	Cond Unit Heater from power draft (replace)	Install condensing power draft units (90% seas. Eff) in place of power draft (80% seas. Eff)	At Replacement	Heating	398	270	na	\$1.50	0.885	450
H116	Cond Furnace (repl)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.	At Replacement	Heating	693	525	na	\$1.78	1.063	652
E110	Roof Insulation - Blanket R11-41	Roof Insulation - Blanket R11-41. Application: Buildings with open truss unfinished interior	Retrofit	Heating	122	124	\$0.11	\$1.83	0.360	339
E109	Roof Insulation - Blanket R11-30	Roof Insulation - Blanket R11-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	102	104	\$0.12	\$1.95	0.518	196
H122	HVAC System Commissioning	HVAC system commissioning. Includes testing and balancing, damper settings, economizer settings, and proper HVAC heating and compressor control installation. This measure includes the proper set-up of single zone package equipment in simple HVAC systems. The majority of the Commercial area is served by this technology. Work done in Eugene (Davis, et al, 2002) suggests higher savings than the other documented commissioning on more complex systems.	New	Heating	1,381	815	\$0.18	\$2.10	0.478	2,886
W125	Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	New	Water Heat	322	222	na	\$2.26	1.318	244

At an \$0.85/therm levelized cost screen, cumulative therm savings equals 58,729.

At an \$1.00/therm levelized cost screen, cumulative therm savings equals 61,245.

New Measures in 2008:

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Gas Savings to 2030 (000's)	Levelized Cost, \$/kWh	Levelized Cost, \$/th
Co102	Infrared Fryer		Retrofit	Cooking	35	na	\$0.41
Co104	Infrared Griddle		Retrofit	Cooking	35	na	\$1.19

Appendix E

SUPPLY RESOURCE ALTERNATIVES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES

	Description	Pipeline	Daily MDQ	Start Date	End Date	Lead Time	Cost Dths	Additional Comments
INCR-PGT	Kingsgate to Central Oregon	GTN		Nov-10	Oct-24	2 years	GTN Rate X 3	
INCR-WGPW	Sumas to WA and OR citygates	NWP		Nov-10	Oct-24	2 years	NWP Rate X 3	
Sunstone	Rockies to Stanfield Interconnect	Sunstone	28000	Nov-11	Dec-30	> 2 years	Precedent Agmt	Sunstone capacity, 30 year term
Sunstone 25	Rockies to Stanfield Interconnect	Sunstone	0	Nov-11	Dec-30	> 2 years	Precedent Agmt	Sunstone capacity, 25 year term
Sunstone 20	Rockies to Stanfield Interconnect	Sunstone	0	Nov-11	Dec-30	> 2 years	Precedent Agmt	Sunstone capacity, 20 year term
Sunstone 15	Rockies to Stanfield Interconnect	Sunstone	Varies	Nov-11	Sep-27	> 2 years	Precedent Agmt	Sunstone capacity, 15 year term
Sunstone 10	Rockies to Stanfield Interconnect	Sunstone	0	Nov-11	Sep-22	> 2 years	Precedent Agmt	Sunstone capacity, 10 year term
Sunstone 10	Rockies to Stanfield Interconnect	Sunstone	0	Oct-22	Dec-30	> 2 years	Precedent Agmt	Sunstone capacity, 10 year term, delayed until 2022
INCR-STAINF	Stanfield Interconnect to Central OR	GTN	76000	Oct-11	Dec-30	> 2 years	GTN Rate	
AECO POOL	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN	Varies	Nov-11	Dec-30	3 years	NOVA, Foothills, GTN	
Bluebridge25	Stanfield Interconnect to I-5 Corridor	NWP	51000	Nov-11	Dec-30	> 2 years	Precedent Agmt	
Bluebridge15	Stanfield Interconnect to I-5 Corridor	NWP	0	Nov-11	Dec-30	> 2 years	Precedent Agmt	
RUBY XPORT	Opal Hub to Mailin	RUBY	0	Nov-12	Dec-30	> 2 years	NWP Rate X 3	In order to serve CNG citygates will require incremental GTN capacity or firm backhaul capability. For modeling purposes, several sensitivities were run at various rates in addition to what is indicated in this table.
PALOMAR XPORT	Madras OR to Molalla OR (bi-directional)	PALOMAR	0	Nov-15	Dec-30	> 6 years	NWP Rate X 3	This is a bi-directional pipeline. In order to serve CNG citygates will require incremental GTN (Madras) and/or NWP (Molalla) capacity or firm backhaul capability. For modeling purposes, several sensitivities were run at various rates in addition to what is indicated in this table.
PAC CONNECT	Jordona Cove OR to Malin	PAC CONNECT	0	Nov-15	Dec-30	> 5 years	NWP Rate X 3	In order to serve CNG citygates will require incremental GTN capacity or firm backhaul capability. For modeling purposes, several sensitivities were run at various rates in addition to what is indicated in this table.

**Supply Side Resource Alternatives
Integrated Resource Plan**

Model Name	Category	Other Category Info	Receipt Pt	Index	Comm Adder	Demand Chg	Daily Min	Monthly Min	Seasonal Min	Annual Min	Base/Swing	Contract Expiration
FIRM 1	Annual	Annual	Station 2	CGPR (AECO)	Yes	No	100%				Base	2010
FIRM 2	Annual	Annual	Rockies	IFERC Rockies	No	No	100%				Swing	2011
FIRM 3	Annual	Annual	Sumas	IFERC Sumas	Yes	No	100%				Swing	2009
INCR-FIRM 1	Annual	Annual	AECO	CGPR (AECO)	Yes	No					Swing	Incremental
INCR-FIRM 2	Annual	Annual	Rockies	IFERC Rockies	Yes	No					Swing	Incremental
INCR-FIRM3	Annual	Annual	Sumas	IFERC Sumas	Yes	No					Swing	Incremental
BIOMASS	Biomass		Zone 11	IFERC Rockies	No	No					Base	Incremental
FIRM 4	Citygate	Nov-Mar	Citygate	CGPR (AECO)	Yes	No					Base	2010
IMP-LNG 1	Imported LNG		Palomar	NYMEX	Yes	No					Swing	Incremental
IMP-LNG 2	Imported LNG		Pacific Connector	NYMEX	Yes	No					Swing	Incremental
IMP-LNG 3	Imported LNG		Kitimat	NYMEX	Yes	No					Swing	Incremental
INCR PEAK 1	Peaking		AECO	CGPR (AECO)	Yes	Yes					Swing	Incremental
INCR PEAK 2	Peaking		Rockies	IFERC Rockies	Yes	Yes					Swing	Incremental
INCR PEAK 3	Peaking		Sumas	IFERC Sumas	Yes	Yes					Swing	Incremental
PEAK 1	Peaking		Rockies	GD Rockies	Yes	Yes					Swing	2009
PEAK 2	Peaking		Sumas	GD Sumas	Yes	Yes					Swing	2012
PEAK 3	Peaking		Rockies	IFERC Rockies	Yes	No					Swing	2009
PEAK 4	Peaking		Citygate	IFERC Rockies	Yes	No					Swing	2013
SAT LNG	Satellite LNG		Zone 10	NYMEX	No	No					Base	Incremental
FIRM 5	Seasonal/Winter	Dec-Jan	AECO	CGPR (AECO)	Yes	No	100%				Swing	2011
FIRM 6	Seasonal/Winter	Nov-Feb	Station 2	CGPR (AECO)	Yes	No	100%				Swing	2012
FIRM 7	Seasonal/Winter	Nov-Jan	AECO	CGPR (AECO)	Yes	No	100%				Swing	2012
FIRM 8	Seasonal/Winter	Nov-Mar	AECO	CGPR (AECO)	Yes	No	100%				Swing	2012
FIRM 9	Seasonal/Winter	Nov-Mar	Sumas	CGPR (AECO)	Yes	No					Base	2011
FIRM 10	Seasonal/Winter	Nov	Rockies	IFERC Rockies	Yes	No	100%				Swing	2009
FIRM 11	Seasonal/Winter	Nov-Feb	Rockies	IFERC Rockies	Yes	No	100%				Swing	2011
FIRM 12	Seasonal/Winter	Nov-Mar	Rockies	IFERC Rockies	Yes	Yes			50%		Base	2012
FIRM 13	Seasonal/Winter	Nov-Oct	Rockies	IFERC Rockies	Yes	No	100%				Swing	2012
FIRM 14	Seasonal/Winter	Apr-Oct	Sumas	IFERC Sumas	Yes	No	100%				Swing	2009
FIRM 15	Seasonal/Winter	Dec-Jan	Citygate	IFERC Sumas	Yes	No	100%				Swing	2009
FIRM 16	Seasonal/Winter	Nov-Mar	Sumas	IFERC Sumas	Yes	No	100%				Swing	2012
INCR WTR 1	Seasonal/Winter	Nov-Mar	AECO	CGPR (AECO)	Yes	No					Swing	Incremental
INCR WTR 2	Seasonal/Winter	Nov-Mar	Sumas	GD STA2	Yes	Yes					Base	Incremental
INCR WTR 3	Seasonal/Winter	Nov-Mar	Rockies	IFERC Rockies	Yes	No					Swing	Incremental
INCR WTR 4	Seasonal/Winter	Nov-Mar	Rockies	IFERC Rockies	Yes	No					Base	Incremental
INCR WTR 5	Seasonal/Winter	Nov-Mar	Sumas	IFERC Sumas	Yes	No					Swing	Incremental
SPOT CDN	Spot		Station 2	CGPR (AECO)	No	No					Swing	Incremental
SPOT RM	Spot		Rockies	IFERC Rockies	Yes	No					Base	2012
SPOT SUMAS	Spot		Sumas	IFERC Sumas	Yes	Yes					Base	Incremental

Model Name	Type	Location	Pipeline Transport Required	Evergreen	Contract Expiration
STORAGE 1	JP-1	Underground	Jackson Prairie	Yes	2014
STORAGE 2	JP-EXP	Underground	Jackson Prairie	Yes	2050
STORAGE 3	LNG	LNG	Plymouth	Yes	2014

CASCADE NATURAL GAS-- PRICE FORECAST EXHIBIT
(\$2008)

	Henry Hub			Rockies			Gas Supply			Sumas			AECO		
	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)
Nov-08	\$ 9.0000	\$10.0000	\$11.0000	\$ 7.2000	\$ 8.0000	\$ 8.8000	\$ 8.6850	\$ 9.6500	\$10.6150	\$ 8.3880	\$ 9.3200	\$10.2520			
Dec-08	\$ 9.1800	\$10.2000	\$11.2200	\$ 7.3800	\$ 8.2000	\$ 9.0200	\$ 8.8650	\$ 9.8500	\$10.8350	\$ 8.5680	\$ 9.5200	\$10.4720			
Jan-09	\$ 8.4027	\$ 9.3363	\$10.2699	\$ 6.4272	\$ 7.1413	\$ 7.8555	\$ 8.0629	\$ 8.9588	\$ 9.8546	\$ 7.7894	\$ 8.6549	\$ 9.5204			
Feb-09	\$ 7.7876	\$ 8.6529	\$ 9.5182	\$ 5.8056	\$ 6.4506	\$ 7.0957	\$ 7.4180	\$ 8.2423	\$ 9.0665	\$ 7.1759	\$ 7.9732	\$ 8.7705			
Mar-09	\$ 6.4828	\$ 7.2031	\$ 7.9234	\$ 4.5921	\$ 5.1024	\$ 5.6126	\$ 6.3233	\$ 7.0259	\$ 7.7285	\$ 6.0714	\$ 6.7460	\$ 7.4206			
Apr-09	\$ 6.1586	\$ 6.8429	\$ 7.5272	\$ 4.2057	\$ 4.6730	\$ 5.1402	\$ 5.8492	\$ 6.4991	\$ 7.1490	\$ 5.7129	\$ 6.3477	\$ 6.9825			
May-09	\$ 6.6573	\$ 7.3970	\$ 8.1367	\$ 4.6610	\$ 5.1789	\$ 5.6968	\$ 6.2905	\$ 6.9894	\$ 7.6884	\$ 6.2208	\$ 6.9120	\$ 7.6032			
Jun-09	\$ 6.6490	\$ 7.3878	\$ 8.1266	\$ 4.6292	\$ 5.1436	\$ 5.6579	\$ 6.2684	\$ 6.9649	\$ 7.6614	\$ 6.2420	\$ 6.9356	\$ 7.6291			
Jul-09	\$ 6.6158	\$ 7.3508	\$ 8.0859	\$ 4.5665	\$ 5.0738	\$ 5.5812	\$ 6.2464	\$ 6.9404	\$ 7.6344	\$ 6.1963	\$ 6.8848	\$ 7.5733			
Aug-09	\$ 7.0473	\$ 7.8303	\$ 8.6133	\$ 4.9755	\$ 5.5283	\$ 6.0811	\$ 6.6493	\$ 7.3881	\$ 8.1269	\$ 6.5917	\$ 7.3241	\$ 8.0565			
Sep-09	\$ 6.7984	\$ 7.5538	\$ 8.3092	\$ 4.8063	\$ 5.3404	\$ 5.8744	\$ 6.5022	\$ 7.2246	\$ 7.9471	\$ 6.3689	\$ 7.0765	\$ 7.7842			
Oct-09	\$ 6.7432	\$ 7.4924	\$ 8.2417	\$ 4.8308	\$ 5.3675	\$ 5.9043	\$ 6.4220	\$ 7.1355	\$ 7.8491	\$ 6.3310	\$ 7.0344	\$ 7.7378			
Nov-09	\$ 7.0444	\$ 7.8271	\$ 8.6098	\$ 5.4195	\$ 6.0217	\$ 6.6239	\$ 6.8896	\$ 7.6551	\$ 8.4206	\$ 6.6492	\$ 7.3880	\$ 8.1268			
Dec-09	\$ 7.0406	\$ 7.8229	\$ 8.6052	\$ 5.4562	\$ 6.0625	\$ 6.6687	\$ 6.9084	\$ 7.6760	\$ 8.4436	\$ 6.6592	\$ 7.3991	\$ 8.1390			
Jan-10	\$ 7.1840	\$ 7.9823	\$ 8.7805	\$ 5.3413	\$ 5.9348	\$ 6.5283	\$ 7.0503	\$ 7.8337	\$ 8.6170	\$ 6.7986	\$ 7.5540	\$ 8.3094			
Feb-10	\$ 7.2654	\$ 8.0727	\$ 8.8799	\$ 5.3742	\$ 5.9713	\$ 6.5685	\$ 7.1058	\$ 7.8953	\$ 8.6849	\$ 6.8849	\$ 7.6499	\$ 8.4149			
Mar-10	\$ 5.9200	\$ 6.5778	\$ 7.2356	\$ 4.3129	\$ 4.7921	\$ 5.2713	\$ 5.9264	\$ 6.5848	\$ 7.2433	\$ 5.6963	\$ 6.3293	\$ 6.9622			
Apr-10	\$ 5.9837	\$ 6.6485	\$ 7.3134	\$ 4.2492	\$ 4.7213	\$ 5.1934	\$ 5.8320	\$ 6.4800	\$ 7.1280	\$ 5.7140	\$ 6.3489	\$ 6.9838			
May-10	\$ 6.0206	\$ 6.6896	\$ 7.3586	\$ 4.2037	\$ 4.6707	\$ 5.1378	\$ 5.8707	\$ 6.5230	\$ 7.1753	\$ 5.7666	\$ 6.4074	\$ 7.0481			
Jun-10	\$ 6.0669	\$ 6.7410	\$ 7.4151	\$ 4.2304	\$ 4.7004	\$ 5.1704	\$ 5.8357	\$ 6.4841	\$ 7.1325	\$ 5.8108	\$ 6.4564	\$ 7.1021			
Jul-10	\$ 6.1249	\$ 6.8055	\$ 7.4860	\$ 4.2511	\$ 4.7234	\$ 5.1958	\$ 5.8901	\$ 6.5446	\$ 7.1991	\$ 5.8504	\$ 6.5004	\$ 7.1505			
Aug-10	\$ 6.1563	\$ 6.8403	\$ 7.5243	\$ 4.2650	\$ 4.7388	\$ 5.2127	\$ 5.9098	\$ 6.5664	\$ 7.2231	\$ 5.8515	\$ 6.5017	\$ 7.1518			
Sep-10	\$ 6.1871	\$ 6.8746	\$ 7.5620	\$ 4.3421	\$ 4.8246	\$ 5.3070	\$ 6.0024	\$ 6.6693	\$ 7.3363	\$ 5.8953	\$ 6.5503	\$ 7.2053			
Oct-10	\$ 6.1927	\$ 6.8808	\$ 7.5688	\$ 4.3878	\$ 4.8753	\$ 5.3628	\$ 6.0591	\$ 6.7323	\$ 7.4055	\$ 5.9213	\$ 6.5792	\$ 7.2371			
Nov-10	\$ 6.4359	\$ 7.1510	\$ 7.8661	\$ 5.0684	\$ 5.6316	\$ 6.1948	\$ 6.4317	\$ 7.1463	\$ 7.8610	\$ 6.2356	\$ 6.9284	\$ 7.6213			
Dec-10	\$ 6.4578	\$ 7.1753	\$ 7.8929	\$ 5.1412	\$ 5.7124	\$ 6.2837	\$ 6.4035	\$ 7.1149	\$ 7.8264	\$ 6.2052	\$ 6.8946	\$ 7.5841			
Jan-11	\$ 6.4583	\$ 7.1759	\$ 7.8935	\$ 5.0959	\$ 5.6621	\$ 6.2283	\$ 6.4131	\$ 7.1257	\$ 7.8382	\$ 6.2125	\$ 6.9028	\$ 7.5931			
Feb-11	\$ 6.4926	\$ 7.2140	\$ 7.9354	\$ 5.0923	\$ 5.6581	\$ 6.2239	\$ 6.4307	\$ 7.1453	\$ 7.8598	\$ 6.2437	\$ 6.9374	\$ 7.6312			
Mar-11	\$ 5.8832	\$ 6.5369	\$ 7.1906	\$ 5.4141	\$ 6.0156	\$ 6.6172	\$ 5.9038	\$ 6.5598	\$ 7.2158	\$ 5.7289	\$ 6.3654	\$ 7.0020			
Apr-11	\$ 5.9424	\$ 6.6027	\$ 7.2630	\$ 5.3931	\$ 5.9923	\$ 6.5916	\$ 5.8406	\$ 6.4896	\$ 7.1385	\$ 5.7243	\$ 6.3603	\$ 6.9963			
May-11	\$ 6.0037	\$ 6.6708	\$ 7.3379	\$ 5.4346	\$ 6.0385	\$ 6.6423	\$ 5.8955	\$ 6.5506	\$ 7.2056	\$ 5.7918	\$ 6.4353	\$ 7.0788			
Jun-11	\$ 6.0409	\$ 6.7121	\$ 7.3833	\$ 5.4708	\$ 6.0787	\$ 6.6865	\$ 5.8993	\$ 6.5548	\$ 7.2102	\$ 5.8321	\$ 6.4802	\$ 7.1282			
Jul-11	\$ 6.0983	\$ 6.7759	\$ 7.4534	\$ 5.4961	\$ 6.1068	\$ 6.7174	\$ 5.9301	\$ 6.5890	\$ 7.2479	\$ 5.8487	\$ 6.4985	\$ 7.1484			
Aug-11	\$ 6.1359	\$ 6.8177	\$ 7.4994	\$ 5.5277	\$ 6.1418	\$ 6.7560	\$ 5.9659	\$ 6.6288	\$ 7.2916	\$ 5.8645	\$ 6.5161	\$ 7.1677			
Sep-11	\$ 6.1534	\$ 6.8371	\$ 7.5209	\$ 5.5699	\$ 6.1887	\$ 6.8076	\$ 6.0115	\$ 6.6794	\$ 7.3473	\$ 5.9012	\$ 6.5569	\$ 7.2126			
Oct-11	\$ 6.1437	\$ 6.8264	\$ 7.5090	\$ 5.6186	\$ 6.2429	\$ 6.8672	\$ 6.0551	\$ 6.7279	\$ 7.4007	\$ 5.9190	\$ 6.5767	\$ 7.2344			
Nov-11	\$ 6.3779	\$ 7.0866	\$ 7.7952	\$ 5.8951	\$ 6.5501	\$ 7.2052	\$ 6.3287	\$ 7.0319	\$ 7.7351	\$ 6.1431	\$ 6.8257	\$ 7.5082			
Dec-11	\$ 6.4480	\$ 7.1644	\$ 7.8809	\$ 5.9911	\$ 6.6568	\$ 7.3225	\$ 6.3704	\$ 7.0782	\$ 7.7861	\$ 6.1819	\$ 6.8688	\$ 7.5557			
Jan-12	\$ 6.4508	\$ 7.1675	\$ 7.8843	\$ 5.9478	\$ 6.6087	\$ 7.2696	\$ 6.3380	\$ 7.0422	\$ 7.7465	\$ 6.1492	\$ 6.8324	\$ 7.5157			
Feb-12	\$ 6.4891	\$ 7.2101	\$ 7.9311	\$ 5.9959	\$ 6.6621	\$ 7.3284	\$ 6.3754	\$ 7.0838	\$ 7.7922	\$ 6.1862	\$ 6.8736	\$ 7.5699			

CASCADE NATURAL GAS-- PRICE FORECAST EXHIBIT
(\$2008)

	Henry Hub			Rockies			Gas Supply			Sumas			AECO		
	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)
Mar-12	\$ 5.9710	\$ 6.6344	\$ 7.2979	\$ 5.5028	\$ 6.1142	\$ 6.7257	\$ 6.0023	\$ 6.6692	\$ 7.3361	\$ 5.8160	\$ 6.4622	\$ 7.1084			
Apr-12	\$ 6.1127	\$ 6.7919	\$ 7.4711	\$ 5.5267	\$ 6.1408	\$ 6.7549	\$ 6.0411	\$ 6.7123	\$ 7.3835	\$ 5.9204	\$ 6.5782	\$ 7.2360			
May-12	\$ 6.1068	\$ 6.7853	\$ 7.4638	\$ 5.5081	\$ 6.1202	\$ 6.7322	\$ 6.0453	\$ 6.7170	\$ 7.3887	\$ 5.9389	\$ 6.5987	\$ 7.2586			
Jun-12	\$ 6.2075	\$ 6.8972	\$ 7.5870	\$ 5.6107	\$ 6.2341	\$ 6.8575	\$ 6.0617	\$ 6.7352	\$ 7.4088	\$ 5.9905	\$ 6.6561	\$ 7.3217			
Jul-12	\$ 6.1992	\$ 6.8880	\$ 7.5768	\$ 5.5991	\$ 6.2212	\$ 6.8434	\$ 6.0787	\$ 6.7541	\$ 7.4295	\$ 5.9956	\$ 6.6617	\$ 7.3279			
Aug-12	\$ 6.2398	\$ 6.9331	\$ 7.6264	\$ 5.6355	\$ 6.2617	\$ 6.8878	\$ 6.1248	\$ 6.8053	\$ 7.4859	\$ 6.0254	\$ 6.6949	\$ 7.3644			
Sep-12	\$ 6.2557	\$ 6.9508	\$ 7.6459	\$ 5.6781	\$ 6.3090	\$ 6.9399	\$ 6.1693	\$ 6.8548	\$ 7.5403	\$ 6.0560	\$ 6.7289	\$ 7.4018			
Oct-12	\$ 6.2562	\$ 6.9514	\$ 7.6465	\$ 5.7340	\$ 6.3711	\$ 7.0082	\$ 6.2113	\$ 6.9015	\$ 7.5916	\$ 6.0684	\$ 6.7427	\$ 7.4169			
Nov-12	\$ 6.4976	\$ 7.2195	\$ 7.9415	\$ 6.0079	\$ 6.6754	\$ 7.3430	\$ 6.5003	\$ 7.2225	\$ 7.9448	\$ 6.3070	\$ 7.0078	\$ 7.7085			
Dec-12	\$ 6.5508	\$ 7.2787	\$ 8.0065	\$ 6.0830	\$ 6.7589	\$ 7.4348	\$ 6.5464	\$ 7.2738	\$ 8.0011	\$ 6.3508	\$ 7.0565	\$ 7.7621			
Jan-13	\$ 6.5398	\$ 7.2664	\$ 7.9931	\$ 6.0420	\$ 6.7133	\$ 7.3846	\$ 6.4874	\$ 7.2082	\$ 7.9290	\$ 6.2895	\$ 6.9883	\$ 7.6872			
Feb-13	\$ 6.5786	\$ 7.3096	\$ 8.0406	\$ 6.0728	\$ 6.7476	\$ 7.4223	\$ 6.5200	\$ 7.2444	\$ 7.9689	\$ 6.3258	\$ 7.0287	\$ 7.7316			
Mar-13	\$ 6.0945	\$ 6.7716	\$ 7.4488	\$ 5.6394	\$ 6.2660	\$ 6.8926	\$ 6.1999	\$ 6.8888	\$ 7.5777	\$ 6.0066	\$ 6.6740	\$ 7.3414			
Apr-13	\$ 6.1786	\$ 6.8651	\$ 7.5516	\$ 5.6341	\$ 6.2601	\$ 6.8861	\$ 6.1699	\$ 6.8554	\$ 7.5409	\$ 6.0479	\$ 6.7199	\$ 7.3919			
May-13	\$ 6.2228	\$ 6.9142	\$ 7.6056	\$ 5.6631	\$ 6.2924	\$ 6.9216	\$ 6.2235	\$ 6.9150	\$ 7.6065	\$ 6.1150	\$ 6.7945	\$ 7.4739			
Jun-13	\$ 6.2588	\$ 6.9542	\$ 7.6497	\$ 5.7115	\$ 6.3461	\$ 6.9807	\$ 6.2436	\$ 6.9373	\$ 7.6311	\$ 6.1620	\$ 6.8466	\$ 7.5313			
Jul-13	\$ 6.3318	\$ 7.0353	\$ 7.7388	\$ 5.7452	\$ 6.3836	\$ 7.0219	\$ 6.2933	\$ 6.9926	\$ 7.6919	\$ 6.1931	\$ 6.8812	\$ 7.5694			
Aug-13	\$ 6.3633	\$ 7.0703	\$ 7.7774	\$ 5.7827	\$ 6.4252	\$ 7.0677	\$ 6.3329	\$ 7.0366	\$ 7.7402	\$ 6.2185	\$ 6.9094	\$ 7.6004			
Sep-13	\$ 6.3769	\$ 7.0854	\$ 7.7940	\$ 5.8266	\$ 6.4740	\$ 7.1214	\$ 6.3845	\$ 7.0939	\$ 7.8032	\$ 6.2669	\$ 6.9632	\$ 7.6595			
Oct-13	\$ 6.3932	\$ 7.1036	\$ 7.8139	\$ 5.8816	\$ 6.5352	\$ 7.1887	\$ 6.4376	\$ 7.1528	\$ 7.8681	\$ 6.2866	\$ 6.9851	\$ 7.6836			
Nov-13	\$ 6.6593	\$ 7.3992	\$ 8.1391	\$ 6.1728	\$ 6.8587	\$ 7.5445	\$ 6.7364	\$ 7.4848	\$ 8.2333	\$ 6.5330	\$ 7.2589	\$ 7.9848			
Dec-13	\$ 6.7931	\$ 7.5479	\$ 8.3027	\$ 6.3096	\$ 7.0107	\$ 7.7117	\$ 6.8110	\$ 7.5677	\$ 8.3245	\$ 6.6061	\$ 7.3401	\$ 8.0741			
Jan-14	\$ 6.6890	\$ 7.4322	\$ 8.1754	\$ 6.1968	\$ 6.8853	\$ 7.5739	\$ 6.7061	\$ 7.4512	\$ 8.1963	\$ 6.4947	\$ 7.2163	\$ 7.9379			
Feb-14	\$ 6.7287	\$ 7.4764	\$ 8.2240	\$ 6.2253	\$ 6.9170	\$ 7.6087	\$ 6.7347	\$ 7.4830	\$ 8.2313	\$ 6.5319	\$ 7.2577	\$ 7.9834			
Mar-14	\$ 6.3316	\$ 7.0351	\$ 7.7386	\$ 5.8353	\$ 6.4837	\$ 7.1321	\$ 6.4398	\$ 7.1553	\$ 7.8708	\$ 6.2360	\$ 6.9288	\$ 7.6217			
Apr-14	\$ 6.3626	\$ 7.0696	\$ 7.7765	\$ 5.7953	\$ 6.4392	\$ 7.0832	\$ 6.4177	\$ 7.1307	\$ 7.8438	\$ 6.2853	\$ 6.9837	\$ 7.6821			
May-14	\$ 6.4343	\$ 7.1493	\$ 7.8642	\$ 5.8360	\$ 6.4844	\$ 7.1329	\$ 6.4979	\$ 7.2199	\$ 7.9419	\$ 6.3831	\$ 7.0923	\$ 7.8015			
Jun-14	\$ 6.4694	\$ 7.1882	\$ 7.9071	\$ 5.8863	\$ 6.5403	\$ 7.1943	\$ 6.4817	\$ 7.2019	\$ 7.9221	\$ 6.4043	\$ 7.1159	\$ 7.8275			
Jul-14	\$ 6.5370	\$ 7.2633	\$ 7.9897	\$ 5.9188	\$ 6.5765	\$ 7.2341	\$ 6.5165	\$ 7.2405	\$ 7.9646	\$ 6.4132	\$ 7.1258	\$ 7.8384			
Aug-14	\$ 6.5760	\$ 7.3066	\$ 8.0373	\$ 5.9569	\$ 6.6188	\$ 7.2807	\$ 6.5575	\$ 7.2861	\$ 8.0148	\$ 6.4403	\$ 7.1559	\$ 7.8715			
Sep-14	\$ 6.6031	\$ 7.3368	\$ 8.0705	\$ 6.0056	\$ 6.6729	\$ 7.3401	\$ 6.6073	\$ 7.3414	\$ 8.0755	\$ 6.4863	\$ 7.2070	\$ 7.9277			
Oct-14	\$ 6.5683	\$ 7.2981	\$ 8.0279	\$ 6.0175	\$ 6.6861	\$ 7.3547	\$ 6.6251	\$ 7.3613	\$ 8.0974	\$ 6.4687	\$ 7.1874	\$ 7.9062			
Nov-14	\$ 6.8391	\$ 7.5990	\$ 8.3589	\$ 6.3093	\$ 7.0103	\$ 7.7114	\$ 6.9238	\$ 7.6932	\$ 8.4625	\$ 6.7106	\$ 7.4563	\$ 8.2019			
Dec-14	\$ 6.9664	\$ 7.7405	\$ 8.5145	\$ 6.4508	\$ 7.1675	\$ 7.8843	\$ 6.9998	\$ 7.7776	\$ 8.5553	\$ 6.7839	\$ 7.5376	\$ 8.2914			
Jan-15	\$ 7.0483	\$ 7.8315	\$ 8.6146	\$ 6.4796	\$ 7.1996	\$ 7.9195	\$ 7.0257	\$ 7.8063	\$ 8.5870	\$ 6.7821	\$ 7.5357	\$ 8.2892			
Feb-15	\$ 7.0877	\$ 7.8752	\$ 8.6627	\$ 6.5066	\$ 7.2295	\$ 7.9525	\$ 7.0333	\$ 7.8148	\$ 8.5963	\$ 6.8063	\$ 7.5626	\$ 8.3188			
Mar-15	\$ 6.1841	\$ 6.8712	\$ 7.5584	\$ 5.6250	\$ 6.2500	\$ 6.8750	\$ 6.2799	\$ 6.9776	\$ 7.6754	\$ 6.0791	\$ 6.7545	\$ 7.4300			
Apr-15	\$ 6.2272	\$ 6.9192	\$ 7.6111	\$ 5.4917	\$ 6.1019	\$ 6.7121	\$ 6.2233	\$ 6.9148	\$ 7.6062	\$ 6.0900	\$ 6.7667	\$ 7.4433			
May-15	\$ 6.2698	\$ 6.9664	\$ 7.6631	\$ 5.5165	\$ 6.1295	\$ 6.7424	\$ 6.2778	\$ 6.9753	\$ 7.6728	\$ 6.1623	\$ 6.8470	\$ 7.5317			
Jun-15	\$ 6.3028	\$ 7.0031	\$ 7.7034	\$ 5.5529	\$ 6.1699	\$ 6.7869	\$ 6.2863	\$ 6.9847	\$ 7.6832	\$ 6.1915	\$ 6.8794	\$ 7.5399			

CASCADE NATURAL GAS-- PRICE FORECAST EXHIBIT
(\$2008)

	Henry Hub			Rockies			Gas Supply			Sumas			AECO		
	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)
Jul-15	\$ 6.3334	\$ 7.0371	\$ 7.7408	\$ 5.5583	\$ 6.1758	\$ 6.7934	\$ 6.3156	\$ 7.0173	\$ 7.7191	\$ 6.2123	\$ 6.9025	\$ 7.5928			
Aug-15	\$ 6.3735	\$ 7.0816	\$ 7.7898	\$ 5.5934	\$ 6.2149	\$ 6.8364	\$ 6.3541	\$ 7.0601	\$ 7.7661	\$ 6.2375	\$ 6.9305	\$ 7.6236			
Sep-15	\$ 6.3994	\$ 7.1105	\$ 7.8215	\$ 5.6414	\$ 6.2682	\$ 6.8950	\$ 6.4121	\$ 7.1246	\$ 7.8370	\$ 6.2929	\$ 6.9921	\$ 7.6913			
Oct-15	\$ 6.3946	\$ 7.1051	\$ 7.8156	\$ 5.6805	\$ 6.3117	\$ 6.9428	\$ 6.4488	\$ 7.1653	\$ 7.8818	\$ 6.2926	\$ 6.9918	\$ 7.6909			
Nov-15	\$ 6.6655	\$ 7.4061	\$ 8.1467	\$ 5.9888	\$ 6.6542	\$ 7.3196	\$ 6.7064	\$ 7.4515	\$ 8.1967	\$ 6.4908	\$ 7.2120	\$ 7.9332			
Dec-15	\$ 6.7929	\$ 7.5476	\$ 8.3024	\$ 6.1177	\$ 6.7974	\$ 7.4772	\$ 6.7824	\$ 7.5360	\$ 8.2896	\$ 6.5645	\$ 7.2939	\$ 8.0233			
Jan-16	\$ 6.7946	\$ 7.5496	\$ 8.3046	\$ 6.1170	\$ 6.7967	\$ 7.4764	\$ 6.7839	\$ 7.5377	\$ 8.2915	\$ 6.5504	\$ 7.2782	\$ 8.0060			
Feb-16	\$ 6.8350	\$ 7.5945	\$ 8.3539	\$ 6.1520	\$ 6.8355	\$ 7.5191	\$ 6.8036	\$ 7.5595	\$ 8.3155	\$ 6.5888	\$ 7.3209	\$ 8.0530			
Mar-16	\$ 6.4347	\$ 7.1497	\$ 7.8646	\$ 5.7435	\$ 6.3817	\$ 7.0199	\$ 6.4980	\$ 7.2200	\$ 7.9419	\$ 6.2872	\$ 6.9858	\$ 7.6843			
Apr-16	\$ 6.4021	\$ 7.1135	\$ 7.8248	\$ 5.6254	\$ 6.2504	\$ 6.8754	\$ 6.4102	\$ 7.1224	\$ 7.8347	\$ 6.2689	\$ 6.9655	\$ 7.6620			
May-16	\$ 6.4141	\$ 7.1267	\$ 7.8394	\$ 5.6344	\$ 6.2604	\$ 6.8864	\$ 6.4590	\$ 7.1767	\$ 7.8944	\$ 6.3413	\$ 7.0459	\$ 7.7505			
Jun-16	\$ 6.4610	\$ 7.1788	\$ 7.8967	\$ 5.6923	\$ 6.3248	\$ 6.9573	\$ 6.4707	\$ 7.1896	\$ 7.9086	\$ 6.3737	\$ 7.0819	\$ 7.7901			
Jul-16	\$ 6.4912	\$ 7.2125	\$ 7.9337	\$ 5.7104	\$ 6.3449	\$ 6.9793	\$ 6.5024	\$ 7.2249	\$ 7.9474	\$ 6.3962	\$ 7.1069	\$ 7.8176			
Aug-16	\$ 6.5291	\$ 7.2545	\$ 7.9800	\$ 5.7457	\$ 6.3841	\$ 7.0225	\$ 6.5385	\$ 7.2650	\$ 7.9915	\$ 6.4186	\$ 7.1318	\$ 7.8449			
Sep-16	\$ 6.5573	\$ 7.2859	\$ 8.0145	\$ 5.7873	\$ 6.4303	\$ 7.0734	\$ 6.5823	\$ 7.3136	\$ 8.0450	\$ 6.4565	\$ 7.1739	\$ 7.8912			
Oct-16	\$ 6.5866	\$ 7.3185	\$ 8.0503	\$ 5.8507	\$ 6.5008	\$ 7.1509	\$ 6.6625	\$ 7.4027	\$ 8.1430	\$ 6.5024	\$ 7.2249	\$ 7.9474			
Nov-16	\$ 6.8363	\$ 7.5958	\$ 8.3554	\$ 6.1476	\$ 6.8307	\$ 7.5137	\$ 6.9072	\$ 7.6746	\$ 8.4421	\$ 6.6850	\$ 7.4278	\$ 8.1705			
Dec-16	\$ 6.9618	\$ 7.7353	\$ 8.5088	\$ 6.2797	\$ 6.9775	\$ 7.6752	\$ 6.9814	\$ 7.7571	\$ 8.5328	\$ 6.7568	\$ 7.5075	\$ 8.2583			
Jan-17	\$ 6.9464	\$ 7.7182	\$ 8.4900	\$ 6.2528	\$ 6.9476	\$ 7.6423	\$ 6.9664	\$ 7.7404	\$ 8.5144	\$ 6.7288	\$ 7.4765	\$ 8.2241			
Feb-17	\$ 6.9831	\$ 7.7590	\$ 8.5349	\$ 6.2723	\$ 6.9692	\$ 7.6661	\$ 6.9847	\$ 7.7608	\$ 8.5369	\$ 6.7560	\$ 7.5067	\$ 8.2573			
Mar-17	\$ 6.6492	\$ 7.3880	\$ 8.1268	\$ 5.9144	\$ 6.5716	\$ 7.2287	\$ 6.7161	\$ 7.4623	\$ 8.2085	\$ 6.4979	\$ 7.2199	\$ 7.9419			
Apr-17	\$ 6.5341	\$ 7.2601	\$ 7.9861	\$ 5.7296	\$ 6.3662	\$ 7.0028	\$ 6.5672	\$ 7.2969	\$ 8.0266	\$ 6.4176	\$ 7.1307	\$ 7.8438			
May-17	\$ 6.5322	\$ 7.2580	\$ 7.9838	\$ 5.7451	\$ 6.3835	\$ 7.0218	\$ 6.5906	\$ 7.3229	\$ 8.0552	\$ 6.4752	\$ 7.1946	\$ 7.9141			
Jun-17	\$ 6.5641	\$ 7.2935	\$ 8.0228	\$ 5.8072	\$ 6.4524	\$ 7.0976	\$ 6.6025	\$ 7.3362	\$ 8.0698	\$ 6.4996	\$ 7.2217	\$ 7.9439			
Jul-17	\$ 6.5978	\$ 7.3308	\$ 8.0639	\$ 5.8250	\$ 6.4722	\$ 7.1195	\$ 6.6313	\$ 7.3681	\$ 8.1050	\$ 6.5225	\$ 7.2472	\$ 7.9720			
Aug-17	\$ 6.6322	\$ 7.3691	\$ 8.1061	\$ 5.8610	\$ 6.5123	\$ 7.1635	\$ 6.6724	\$ 7.4138	\$ 8.1552	\$ 6.5521	\$ 7.2801	\$ 8.0081			
Sep-17	\$ 6.6350	\$ 7.3722	\$ 8.1094	\$ 5.8854	\$ 6.5393	\$ 7.1932	\$ 6.7085	\$ 7.4539	\$ 8.1993	\$ 6.5776	\$ 7.3084	\$ 8.0393			
Oct-17	\$ 6.7017	\$ 7.4463	\$ 8.1909	\$ 5.9685	\$ 6.6316	\$ 7.2948	\$ 6.7796	\$ 7.5328	\$ 8.2861	\$ 6.6183	\$ 7.3537	\$ 8.0891			
Nov-17	\$ 6.9654	\$ 7.7394	\$ 8.5133	\$ 6.2681	\$ 6.9645	\$ 7.6610	\$ 7.0770	\$ 7.8633	\$ 8.6496	\$ 6.8528	\$ 7.6142	\$ 8.3756			
Dec-17	\$ 7.0908	\$ 7.8786	\$ 8.6665	\$ 6.3976	\$ 7.1085	\$ 7.8193	\$ 7.1476	\$ 7.9417	\$ 8.7359	\$ 6.9184	\$ 7.6872	\$ 8.4559			
Jan-18	\$ 7.1203	\$ 7.9115	\$ 8.7026	\$ 6.4222	\$ 7.1358	\$ 7.8493	\$ 7.1782	\$ 7.9757	\$ 8.7733	\$ 6.9424	\$ 7.7137	\$ 8.4851			
Feb-18	\$ 7.1578	\$ 7.9532	\$ 8.7485	\$ 6.4392	\$ 7.1546	\$ 7.8701	\$ 7.2083	\$ 8.0092	\$ 8.8102	\$ 6.9737	\$ 7.7486	\$ 8.5234			
Mar-18	\$ 6.6780	\$ 7.4201	\$ 8.1621	\$ 5.9679	\$ 6.6310	\$ 7.2941	\$ 6.8234	\$ 7.5815	\$ 8.3397	\$ 6.6050	\$ 7.3389	\$ 8.0728			
Apr-18	\$ 6.5821	\$ 7.3134	\$ 8.0447	\$ 5.7684	\$ 6.4093	\$ 7.0503	\$ 6.6552	\$ 7.3946	\$ 8.1341	\$ 6.5075	\$ 7.2306	\$ 7.9536			
May-18	\$ 6.6453	\$ 7.3837	\$ 8.1220	\$ 5.8327	\$ 6.4808	\$ 7.1289	\$ 6.7394	\$ 7.4882	\$ 8.2370	\$ 6.6195	\$ 7.3550	\$ 8.0905			
Jun-18	\$ 6.6695	\$ 7.4106	\$ 8.1516	\$ 5.8674	\$ 6.5194	\$ 7.1713	\$ 6.7310	\$ 7.4789	\$ 8.2268	\$ 6.6291	\$ 7.3657	\$ 8.1023			
Jul-18	\$ 6.7031	\$ 7.4478	\$ 8.1926	\$ 5.8941	\$ 6.5490	\$ 7.2039	\$ 6.7660	\$ 7.5177	\$ 8.2695	\$ 6.6497	\$ 7.3886	\$ 8.1275			
Aug-18	\$ 6.7818	\$ 7.5353	\$ 8.2889	\$ 5.9683	\$ 6.6315	\$ 7.2946	\$ 6.8544	\$ 7.6160	\$ 8.3776	\$ 6.7283	\$ 7.4759	\$ 8.2235			
Sep-18	\$ 6.7684	\$ 7.5204	\$ 8.2725	\$ 5.9730	\$ 6.6367	\$ 7.3003	\$ 6.8932	\$ 7.6591	\$ 8.4250	\$ 6.7414	\$ 7.4904	\$ 8.2394			
Oct-18	\$ 6.8100	\$ 7.5667	\$ 8.3234	\$ 6.0507	\$ 6.7229	\$ 7.3952	\$ 6.9497	\$ 7.7219	\$ 8.4941	\$ 6.7807	\$ 7.5341	\$ 8.2888			

CASCADE NATURAL GAS-- PRICE FORECAST EXHIBIT
(\$2008)

	Henry Hub			Rockies			Gas Supply			Sumas			AECO		
	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)
Nov-18	\$ 7.0790	\$ 7.8655	\$ 8.6521	\$ 6.3387	\$ 7.0430	\$ 7.7473	\$ 7.2258	\$ 8.0287	\$ 8.8316	\$ 6.9791	\$ 7.7546	\$ 8.5300			
Dec-18	\$ 7.1431	\$ 7.9367	\$ 8.7304	\$ 6.4494	\$ 7.1660	\$ 7.8826	\$ 7.2878	\$ 8.0976	\$ 8.9073	\$ 7.0401	\$ 7.8223	\$ 8.6046			
Jan-19	\$ 7.1930	\$ 7.9922	\$ 8.7914	\$ 6.4677	\$ 7.1864	\$ 7.9050	\$ 7.2939	\$ 8.1044	\$ 8.9148	\$ 7.0517	\$ 7.8352	\$ 8.6187			
Feb-19	\$ 7.2278	\$ 8.0309	\$ 8.8339	\$ 6.4988	\$ 7.2209	\$ 7.9430	\$ 7.3360	\$ 8.1511	\$ 8.9663	\$ 7.0920	\$ 7.8800	\$ 8.6680			
Mar-19	\$ 7.0332	\$ 7.8147	\$ 8.5961	\$ 6.2657	\$ 6.9619	\$ 7.6581	\$ 7.1270	\$ 7.9189	\$ 8.7108	\$ 6.8920	\$ 7.6578	\$ 8.4236			
Apr-19	\$ 6.7792	\$ 7.5325	\$ 8.2857	\$ 5.9283	\$ 6.5870	\$ 7.2458	\$ 6.8463	\$ 7.6070	\$ 8.3677	\$ 6.6634	\$ 7.4038	\$ 8.1442			
May-19	\$ 6.8360	\$ 7.5956	\$ 8.3551	\$ 5.9672	\$ 6.6302	\$ 7.2932	\$ 6.9242	\$ 7.6936	\$ 8.4629	\$ 6.8015	\$ 7.5572	\$ 8.3130			
Jun-19	\$ 6.8305	\$ 7.5894	\$ 8.3483	\$ 6.0264	\$ 6.6960	\$ 7.3655	\$ 6.9125	\$ 7.6806	\$ 8.4487	\$ 6.7933	\$ 7.5481	\$ 8.3029			
Jul-19	\$ 6.8958	\$ 7.6620	\$ 8.4282	\$ 6.0763	\$ 6.7514	\$ 7.4266	\$ 6.9752	\$ 7.7502	\$ 8.5252	\$ 6.8493	\$ 7.6104	\$ 8.3714			
Aug-19	\$ 6.9568	\$ 7.7298	\$ 8.5028	\$ 6.1354	\$ 6.8171	\$ 7.4988	\$ 7.0280	\$ 7.8089	\$ 8.5897	\$ 6.8855	\$ 7.6505	\$ 8.4156			
Sep-19	\$ 6.9117	\$ 7.6797	\$ 8.4476	\$ 6.1195	\$ 6.7994	\$ 7.4793	\$ 7.0566	\$ 7.8407	\$ 8.6248	\$ 6.8937	\$ 7.6597	\$ 8.4256			
Oct-19	\$ 6.9432	\$ 7.7146	\$ 8.4861	\$ 6.2067	\$ 6.8964	\$ 7.5860	\$ 7.0877	\$ 7.8752	\$ 8.6627	\$ 6.9104	\$ 7.6783	\$ 8.4461			
Nov-19	\$ 7.1721	\$ 7.9690	\$ 8.7659	\$ 6.5162	\$ 7.2402	\$ 7.9642	\$ 7.4438	\$ 8.2709	\$ 9.0980	\$ 7.1965	\$ 7.9961	\$ 8.7957			
Dec-19	\$ 7.3496	\$ 8.1662	\$ 8.9828	\$ 6.6890	\$ 7.4322	\$ 8.1754	\$ 7.5518	\$ 8.3909	\$ 9.2299	\$ 7.3079	\$ 8.1199	\$ 8.9319			
Jan-20	\$ 7.3534	\$ 8.1705	\$ 8.9875	\$ 6.7979	\$ 7.5533	\$ 8.3086	\$ 7.5189	\$ 8.3543	\$ 9.1897	\$ 7.2731	\$ 8.0812	\$ 8.8894			
Feb-20	\$ 7.3956	\$ 8.2174	\$ 9.0391	\$ 6.8323	\$ 7.5914	\$ 8.3505	\$ 7.5634	\$ 8.4038	\$ 9.2441	\$ 7.3152	\$ 8.1280	\$ 8.9408			
Mar-20	\$ 6.9129	\$ 7.6810	\$ 8.4491	\$ 6.3398	\$ 7.0443	\$ 7.7487	\$ 7.1266	\$ 7.9184	\$ 8.7102	\$ 6.9007	\$ 7.6674	\$ 8.4342			
Apr-20	\$ 6.7487	\$ 7.4985	\$ 8.2484	\$ 6.0600	\$ 6.7333	\$ 7.4067	\$ 6.8965	\$ 7.6628	\$ 8.4291	\$ 6.7136	\$ 7.4595	\$ 8.2055			
May-20	\$ 6.8303	\$ 7.5893	\$ 8.3482	\$ 5.9752	\$ 6.6391	\$ 7.3030	\$ 6.9133	\$ 7.6814	\$ 8.4496	\$ 6.7772	\$ 7.5302	\$ 8.2832			
Jun-20	\$ 6.8302	\$ 7.5891	\$ 8.3480	\$ 6.1740	\$ 6.8600	\$ 7.5459	\$ 6.9444	\$ 7.7161	\$ 8.4877	\$ 6.8215	\$ 7.5795	\$ 8.3374			
Jul-20	\$ 6.8923	\$ 7.6581	\$ 8.4239	\$ 6.2208	\$ 6.9120	\$ 7.6032	\$ 6.9928	\$ 7.7697	\$ 8.5467	\$ 6.8662	\$ 7.6291	\$ 8.3920			
Aug-20	\$ 6.8985	\$ 7.6650	\$ 8.4315	\$ 6.2367	\$ 6.9297	\$ 7.6227	\$ 7.0206	\$ 7.8007	\$ 8.5808	\$ 6.8664	\$ 7.6293	\$ 8.3922			
Sep-20	\$ 6.9363	\$ 7.7070	\$ 8.4778	\$ 6.3143	\$ 7.0159	\$ 7.7175	\$ 7.1149	\$ 7.9054	\$ 8.6960	\$ 6.9470	\$ 7.7189	\$ 8.4908			
Oct-20	\$ 6.9285	\$ 7.6983	\$ 8.4682	\$ 6.3541	\$ 7.0601	\$ 7.7661	\$ 7.1403	\$ 7.9337	\$ 8.7270	\$ 6.9511	\$ 7.7234	\$ 8.4957			
Nov-20	\$ 7.1645	\$ 7.9606	\$ 8.7566	\$ 6.5752	\$ 7.3058	\$ 8.0364	\$ 7.3748	\$ 8.1942	\$ 9.0136	\$ 7.1417	\$ 7.9353	\$ 8.7288			
Dec-20	\$ 7.1798	\$ 7.9776	\$ 8.7754	\$ 6.6449	\$ 7.3832	\$ 8.1216	\$ 7.3952	\$ 8.2169	\$ 9.0385	\$ 7.1597	\$ 7.9552	\$ 8.7507			
Jan-21	\$ 7.2484	\$ 8.0538	\$ 8.8591	\$ 6.6963	\$ 7.4404	\$ 8.1844	\$ 7.3633	\$ 8.1814	\$ 8.9995	\$ 7.0727	\$ 7.8585	\$ 8.6444			
Feb-21	\$ 7.2868	\$ 8.0964	\$ 8.9061	\$ 6.7194	\$ 7.4660	\$ 8.2126	\$ 7.3573	\$ 8.1748	\$ 8.9922	\$ 7.1112	\$ 7.9013	\$ 8.6915			
Mar-21	\$ 6.4910	\$ 7.2122	\$ 7.9334	\$ 5.9297	\$ 6.5886	\$ 7.2474	\$ 6.5824	\$ 7.3137	\$ 8.0451	\$ 6.3606	\$ 7.0673	\$ 7.7740			
Apr-21	\$ 6.5972	\$ 7.3302	\$ 8.0632	\$ 5.8582	\$ 6.5091	\$ 7.1601	\$ 6.5928	\$ 7.3254	\$ 8.0579	\$ 6.4096	\$ 7.1218	\$ 7.8340			
May-21	\$ 6.6121	\$ 7.3468	\$ 8.0815	\$ 5.8258	\$ 6.4731	\$ 7.1204	\$ 6.5866	\$ 7.3184	\$ 8.0502	\$ 6.4335	\$ 7.1483	\$ 7.8631			
Jun-21	\$ 6.6829	\$ 7.4254	\$ 8.1680	\$ 6.0463	\$ 6.7181	\$ 7.3899	\$ 6.6778	\$ 7.4198	\$ 8.1617	\$ 6.5416	\$ 7.2684	\$ 7.9952			
Jul-21	\$ 6.7128	\$ 7.4587	\$ 8.2046	\$ 6.0799	\$ 6.7554	\$ 7.4310	\$ 6.7014	\$ 7.4460	\$ 8.1906	\$ 6.5668	\$ 7.2964	\$ 8.0261			
Aug-21	\$ 6.7440	\$ 7.4934	\$ 8.2427	\$ 6.1245	\$ 6.8050	\$ 7.4855	\$ 6.7349	\$ 7.4832	\$ 8.2316	\$ 6.5902	\$ 7.3224	\$ 8.0546			
Sep-21	\$ 6.7810	\$ 7.5344	\$ 8.2878	\$ 6.1681	\$ 6.8535	\$ 7.5388	\$ 6.7785	\$ 7.5316	\$ 8.2848	\$ 6.6098	\$ 7.3442	\$ 8.0786			
Oct-21	\$ 6.8182	\$ 7.5758	\$ 8.3334	\$ 6.2046	\$ 6.8940	\$ 7.5834	\$ 6.8385	\$ 7.5983	\$ 8.3582	\$ 6.6544	\$ 7.3937	\$ 8.1331			
Nov-21	\$ 7.1169	\$ 7.9077	\$ 8.6984	\$ 6.4983	\$ 7.2204	\$ 7.9424	\$ 7.1516	\$ 7.9462	\$ 8.7408	\$ 6.9185	\$ 7.6872	\$ 8.4559			
Dec-21	\$ 7.1429	\$ 7.9365	\$ 8.7302	\$ 6.5748	\$ 7.3053	\$ 8.0359	\$ 7.1852	\$ 7.9835	\$ 8.7819	\$ 6.9391	\$ 7.7101	\$ 8.4811			
Jan-22	\$ 7.2052	\$ 8.0057	\$ 8.8063	\$ 6.6306	\$ 7.3673	\$ 8.1041	\$ 7.2358	\$ 8.0398	\$ 8.8438	\$ 6.9239	\$ 7.6933	\$ 8.4626			
Feb-22	\$ 7.2330	\$ 8.0367	\$ 8.8403	\$ 6.6625	\$ 7.4028	\$ 8.1431	\$ 7.1851	\$ 7.9835	\$ 8.7818	\$ 6.9590	\$ 7.7322	\$ 8.5094			

CASCADE NATURAL GAS-- PRICE FORECAST EXHIBIT
(\$2008)

	Henry Hub			Rockies			Gas Supply			Sumas			AECO		
	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)
Mar-22	\$ 6.8756	\$ 7.6396	\$ 8.4036	\$ 6.2904	\$ 6.9894	\$ 7.6883	\$ 6.8484	\$ 7.6094	\$ 8.3703	\$ 6.6277	\$ 7.3642	\$ 8.1006			
Apr-22	\$ 6.7573	\$ 7.5081	\$ 8.2590	\$ 6.1094	\$ 6.7882	\$ 7.4671	\$ 6.6662	\$ 7.4069	\$ 8.1476	\$ 6.4854	\$ 7.2060	\$ 7.9266			
May-22	\$ 6.8476	\$ 7.6085	\$ 8.3693	\$ 6.1653	\$ 6.8503	\$ 7.5354	\$ 6.7393	\$ 7.4881	\$ 8.2369	\$ 6.6087	\$ 7.3430	\$ 8.0773			
Jun-22	\$ 6.8799	\$ 7.6444	\$ 8.4088	\$ 6.2493	\$ 6.9436	\$ 7.6380	\$ 6.7537	\$ 7.5041	\$ 8.2546	\$ 6.6232	\$ 7.3591	\$ 8.0950			
Jul-22	\$ 6.9196	\$ 7.6885	\$ 8.4573	\$ 6.2765	\$ 6.9738	\$ 7.6712	\$ 6.7904	\$ 7.5449	\$ 8.2994	\$ 6.6584	\$ 7.3983	\$ 8.1381			
Aug-22	\$ 6.9388	\$ 7.7098	\$ 8.4808	\$ 6.3007	\$ 7.0008	\$ 7.7008	\$ 6.8277	\$ 7.5863	\$ 8.3449	\$ 6.6698	\$ 7.4109	\$ 8.1520			
Sep-22	\$ 6.9820	\$ 7.7578	\$ 8.5336	\$ 6.3374	\$ 7.0415	\$ 7.7457	\$ 6.8841	\$ 7.6490	\$ 8.4139	\$ 6.7109	\$ 7.4566	\$ 8.2023			
Oct-22	\$ 6.9631	\$ 7.7368	\$ 8.5105	\$ 6.3408	\$ 7.0453	\$ 7.7499	\$ 6.8622	\$ 7.6247	\$ 8.3872	\$ 6.6653	\$ 7.4058	\$ 8.1464			
Nov-22	\$ 7.1580	\$ 7.9534	\$ 8.7487	\$ 6.6244	\$ 7.3604	\$ 8.0965	\$ 7.2358	\$ 8.0397	\$ 8.8437	\$ 6.9984	\$ 7.7760	\$ 8.5536			
Dec-22	\$ 7.3107	\$ 8.1229	\$ 8.9352	\$ 6.7440	\$ 7.4933	\$ 8.2426	\$ 7.2554	\$ 8.0616	\$ 8.8677	\$ 7.0105	\$ 7.7894	\$ 8.5684			
Jan-23	\$ 7.1877	\$ 7.9863	\$ 8.7849	\$ 6.5821	\$ 7.3134	\$ 8.0448	\$ 7.0674	\$ 7.8527	\$ 8.6380	\$ 6.8244	\$ 7.5826	\$ 8.3409			
Feb-23	\$ 7.2172	\$ 8.0191	\$ 8.8210	\$ 6.6066	\$ 7.3407	\$ 8.0748	\$ 7.0877	\$ 7.8752	\$ 8.6627	\$ 6.8574	\$ 7.6194	\$ 8.3813			
Mar-23	\$ 6.8494	\$ 7.6105	\$ 8.3715	\$ 6.2439	\$ 6.9376	\$ 7.6314	\$ 6.7814	\$ 7.5348	\$ 8.2883	\$ 6.5370	\$ 7.2633	\$ 7.9896			
Apr-23	\$ 6.9539	\$ 7.7266	\$ 8.4993	\$ 6.2529	\$ 6.9477	\$ 7.6424	\$ 6.8041	\$ 7.5601	\$ 8.3161	\$ 6.6094	\$ 7.3438	\$ 8.0782			
May-23	\$ 6.9815	\$ 7.7572	\$ 8.5330	\$ 6.2415	\$ 6.9350	\$ 7.6285	\$ 6.8456	\$ 7.6063	\$ 8.3669	\$ 6.7054	\$ 7.4505	\$ 8.1955			
Jun-23	\$ 7.0158	\$ 7.7954	\$ 8.5749	\$ 6.3949	\$ 7.1054	\$ 7.8160	\$ 6.8985	\$ 7.6650	\$ 8.4315	\$ 6.7707	\$ 7.5230	\$ 8.2753			
Jul-23	\$ 7.0761	\$ 7.8624	\$ 8.6486	\$ 6.4461	\$ 7.1623	\$ 7.8785	\$ 6.9449	\$ 7.7166	\$ 8.4882	\$ 6.8114	\$ 7.5682	\$ 8.3251			
Aug-23	\$ 7.1063	\$ 7.8959	\$ 8.6855	\$ 6.4732	\$ 7.1924	\$ 7.9117	\$ 6.9771	\$ 7.7523	\$ 8.5275	\$ 6.8117	\$ 7.5686	\$ 8.3255			
Sep-23	\$ 7.1236	\$ 7.9151	\$ 8.7066	\$ 6.5050	\$ 7.2278	\$ 7.9505	\$ 6.9946	\$ 7.7718	\$ 8.5489	\$ 6.8094	\$ 7.5660	\$ 8.3226			
Oct-23	\$ 7.1651	\$ 7.9612	\$ 8.7573	\$ 6.5460	\$ 7.2734	\$ 8.0007	\$ 7.0366	\$ 7.8185	\$ 8.6003	\$ 6.8338	\$ 7.5931	\$ 8.3524			
Nov-23	\$ 7.5289	\$ 8.3655	\$ 9.2020	\$ 6.9549	\$ 7.7277	\$ 8.5004	\$ 7.4812	\$ 8.3124	\$ 9.1437	\$ 7.2390	\$ 8.0434	\$ 8.8477			
Dec-23	\$ 7.7023	\$ 8.5581	\$ 9.4139	\$ 7.1357	\$ 7.9285	\$ 8.7214	\$ 7.5845	\$ 8.4273	\$ 9.2700	\$ 7.3348	\$ 8.1498	\$ 8.9648			
Jan-24	\$ 7.2372	\$ 8.0413	\$ 8.8454	\$ 6.6850	\$ 7.4278	\$ 8.1705	\$ 7.1055	\$ 7.8950	\$ 8.6845	\$ 6.8548	\$ 7.6165	\$ 8.3781			
Feb-24	\$ 7.2804	\$ 8.0893	\$ 8.8983	\$ 6.7366	\$ 7.4851	\$ 8.2336	\$ 7.1715	\$ 7.9684	\$ 8.7652	\$ 6.9386	\$ 7.7095	\$ 8.4805			
Mar-24	\$ 7.1648	\$ 7.9609	\$ 8.7570	\$ 6.5995	\$ 7.3327	\$ 8.0660	\$ 7.1058	\$ 7.8954	\$ 8.6849	\$ 6.8560	\$ 7.6177	\$ 8.3795			
Apr-24	\$ 7.1360	\$ 7.9288	\$ 8.7217	\$ 6.4693	\$ 7.1881	\$ 7.9069	\$ 6.9862	\$ 7.7625	\$ 8.5387	\$ 6.7896	\$ 7.5440	\$ 8.2984			
May-24	\$ 7.2559	\$ 8.0621	\$ 8.8683	\$ 6.5377	\$ 7.2641	\$ 7.9905	\$ 7.1009	\$ 7.8899	\$ 8.6789	\$ 6.9524	\$ 7.7249	\$ 8.4974			
Jun-24	\$ 7.2502	\$ 8.0558	\$ 8.8614	\$ 6.6251	\$ 7.3612	\$ 8.0973	\$ 7.0662	\$ 7.8514	\$ 8.6365	\$ 6.9323	\$ 7.7025	\$ 8.4728			
Jul-24	\$ 7.3409	\$ 8.1566	\$ 8.9722	\$ 6.6892	\$ 7.4324	\$ 8.1756	\$ 7.1501	\$ 7.9446	\$ 8.7390	\$ 7.0119	\$ 7.7910	\$ 8.5701			
Aug-24	\$ 7.3721	\$ 8.1913	\$ 9.0104	\$ 6.7245	\$ 7.4717	\$ 8.2188	\$ 7.1899	\$ 7.9888	\$ 8.7877	\$ 7.0221	\$ 7.8023	\$ 8.5825			
Sep-24	\$ 7.3708	\$ 8.1898	\$ 9.0087	\$ 6.7441	\$ 7.4934	\$ 8.2428	\$ 7.2330	\$ 8.0367	\$ 8.8404	\$ 7.0465	\$ 7.8295	\$ 8.6124			
Oct-24	\$ 7.4515	\$ 8.2794	\$ 9.1073	\$ 6.8425	\$ 7.6028	\$ 8.3631	\$ 7.2797	\$ 8.0885	\$ 8.8974	\$ 7.0621	\$ 7.8468	\$ 8.6315			
Nov-24	\$ 7.6947	\$ 8.5497	\$ 9.4047	\$ 7.1523	\$ 7.9470	\$ 8.7417	\$ 7.6567	\$ 8.5074	\$ 9.3581	\$ 7.4073	\$ 8.2303	\$ 9.0534			
Dec-24	\$ 7.7554	\$ 8.6171	\$ 9.4788	\$ 7.2067	\$ 8.0075	\$ 8.8082	\$ 7.6323	\$ 8.4803	\$ 9.3283	\$ 7.3775	\$ 8.1972	\$ 9.0169			
Jan-25	\$ 7.6775	\$ 8.5306	\$ 9.3837	\$ 7.1000	\$ 7.8889	\$ 8.6778	\$ 7.5455	\$ 8.3839	\$ 9.2223	\$ 7.2888	\$ 8.0986	\$ 8.9085			
Feb-25	\$ 7.7232	\$ 8.5813	\$ 9.4394	\$ 7.1421	\$ 7.9357	\$ 8.7292	\$ 7.5810	\$ 8.4234	\$ 9.2657	\$ 7.3309	\$ 8.1455	\$ 8.9600			
Mar-25	\$ 7.3821	\$ 8.2023	\$ 9.0225	\$ 6.8005	\$ 7.5562	\$ 8.3118	\$ 7.3244	\$ 8.1383	\$ 8.9521	\$ 7.0459	\$ 7.8288	\$ 8.6116			
Apr-25	\$ 7.2695	\$ 8.0773	\$ 8.8850	\$ 6.6119	\$ 7.3465	\$ 8.0812	\$ 7.1229	\$ 7.9143	\$ 8.7057	\$ 6.9180	\$ 7.6866	\$ 8.4553			
May-25	\$ 7.3937	\$ 8.2153	\$ 9.0368	\$ 6.7189	\$ 7.4655	\$ 8.2120	\$ 7.2476	\$ 8.0528	\$ 8.8581	\$ 7.1003	\$ 7.8892	\$ 8.6782			
Jun-25	\$ 7.3597	\$ 8.1774	\$ 8.9952	\$ 6.7675	\$ 7.5195	\$ 8.2714	\$ 7.1979	\$ 7.9976	\$ 8.7974	\$ 7.0493	\$ 7.8326	\$ 8.6199			

CASCADE NATURAL GAS-- PRICE FORECAST EXHIBIT
(\$2008)

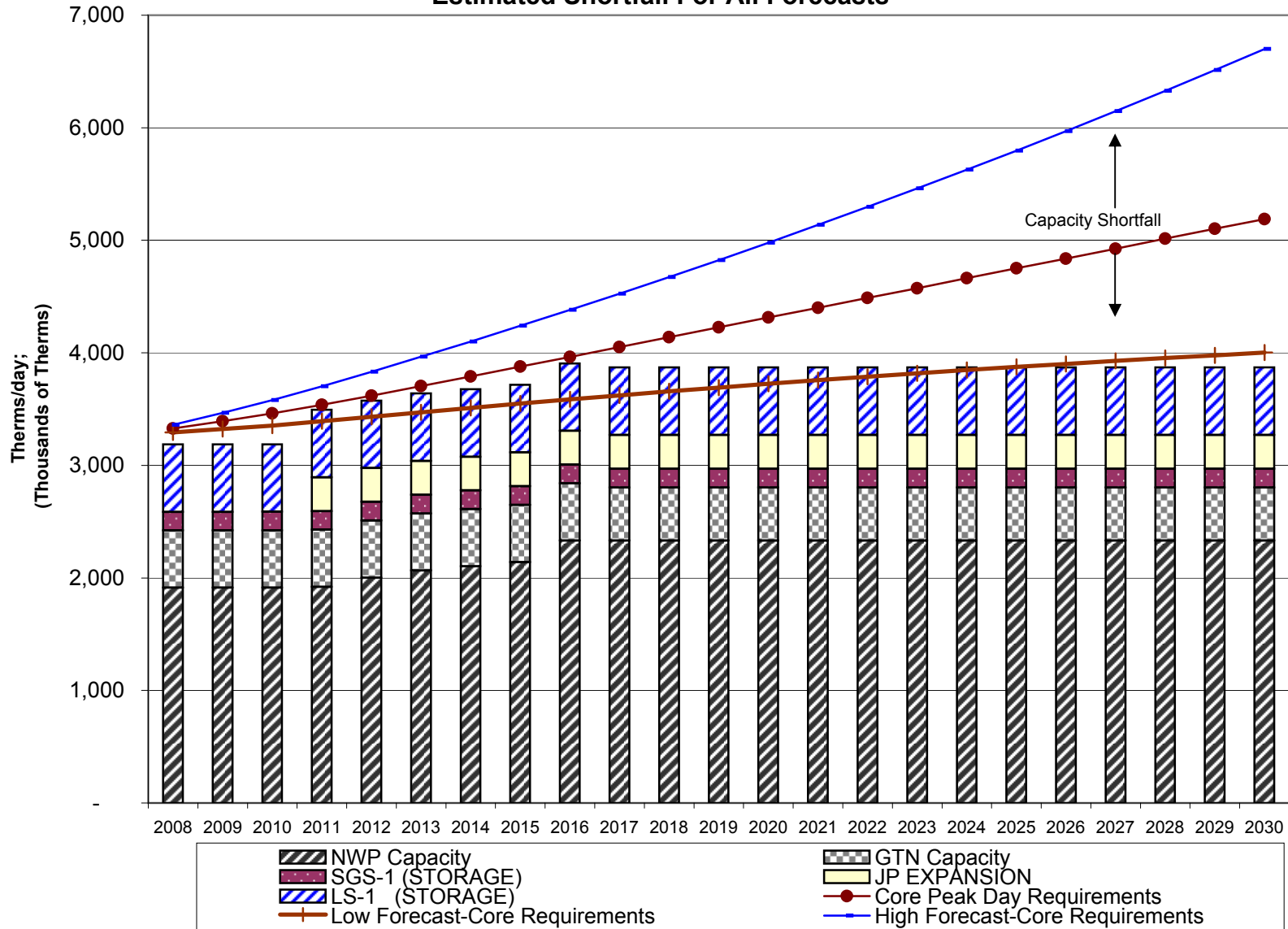
	Henry Hub			Rockies			Gas Supply			Sumas			AECO		
	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)
Jul-25	\$ 7.4263	\$ 8.2514	\$ 9.0766	\$ 6.8148	\$ 7.5720	\$ 8.3292	\$ 7.2730	\$ 8.0812	\$ 8.8893	\$ 7.1185	\$ 7.9094	\$ 8.7003			
Aug-25	\$ 7.3995	\$ 8.2216	\$ 9.0438	\$ 6.8128	\$ 7.5698	\$ 8.3268	\$ 7.3014	\$ 8.1127	\$ 8.9240	\$ 7.1122	\$ 7.9025	\$ 8.6927			
Sep-25	\$ 7.4798	\$ 8.3108	\$ 9.1419	\$ 6.8869	\$ 7.6521	\$ 8.4173	\$ 7.3950	\$ 8.2167	\$ 9.0384	\$ 7.1938	\$ 7.9931	\$ 8.7924			
Oct-25	\$ 7.4833	\$ 8.3148	\$ 9.1463	\$ 6.9183	\$ 7.6870	\$ 8.4557	\$ 7.4464	\$ 8.2737	\$ 9.1011	\$ 7.2366	\$ 8.0406	\$ 8.8447			
Nov-25	\$ 7.7544	\$ 8.6160	\$ 9.4776	\$ 7.2438	\$ 8.0486	\$ 8.8535	\$ 7.7932	\$ 8.6592	\$ 9.5251	\$ 7.5319	\$ 8.3688	\$ 9.2057			
Dec-25	\$ 7.9391	\$ 8.8212	\$ 9.7033	\$ 7.4293	\$ 8.2548	\$ 9.0803	\$ 7.9906	\$ 8.8784	\$ 9.7662	\$ 7.6794	\$ 8.5327	\$ 9.3859			
Jan-26	\$ 8.1567	\$ 9.0630	\$ 9.9693	\$ 7.6353	\$ 8.4837	\$ 9.3321	\$ 8.1988	\$ 9.1098	\$ 10.0207	\$ 7.9480	\$ 8.8312	\$ 9.7143			
Feb-26	\$ 8.2052	\$ 9.1168	\$ 10.0285	\$ 7.9271	\$ 8.8079	\$ 9.6887	\$ 8.2009	\$ 9.1121	\$ 10.0233	\$ 7.9479	\$ 8.8310	\$ 9.7141			
Mar-26	\$ 7.4517	\$ 8.2796	\$ 9.1076	\$ 6.8965	\$ 7.6628	\$ 8.4291	\$ 7.5556	\$ 8.3951	\$ 9.2346	\$ 7.2644	\$ 8.0716	\$ 8.8788			
Apr-26	\$ 7.4694	\$ 8.2993	\$ 9.1293	\$ 6.7918	\$ 7.5465	\$ 8.3011	\$ 7.3436	\$ 8.1595	\$ 8.9755	\$ 7.1284	\$ 7.9204	\$ 8.7125			
May-26	\$ 7.5459	\$ 8.3843	\$ 9.2227	\$ 6.8837	\$ 7.6485	\$ 8.4134	\$ 7.4729	\$ 8.3033	\$ 9.1336	\$ 7.3021	\$ 8.1135	\$ 8.9248			
Jun-26	\$ 7.5284	\$ 8.3649	\$ 9.2013	\$ 6.9117	\$ 7.6796	\$ 8.4476	\$ 7.5005	\$ 8.3339	\$ 9.1673	\$ 7.3226	\$ 8.1362	\$ 8.9498			
Jul-26	\$ 7.5493	\$ 8.3881	\$ 9.2269	\$ 6.9209	\$ 7.6899	\$ 8.4589	\$ 7.5569	\$ 8.3966	\$ 9.2362	\$ 7.3790	\$ 8.1989	\$ 9.0188			
Aug-26	\$ 7.5508	\$ 8.3897	\$ 9.2287	\$ 6.9364	\$ 7.7072	\$ 8.4779	\$ 7.5850	\$ 8.4277	\$ 9.2705	\$ 7.3767	\$ 8.1963	\$ 9.0160			
Sep-26	\$ 7.6275	\$ 8.4750	\$ 9.3225	\$ 7.0160	\$ 7.7956	\$ 8.5751	\$ 7.6766	\$ 8.5295	\$ 9.3825	\$ 7.4587	\$ 8.2875	\$ 9.1162			
Oct-26	\$ 7.6676	\$ 8.5196	\$ 9.3716	\$ 7.0778	\$ 7.8642	\$ 8.6506	\$ 7.6899	\$ 8.5443	\$ 9.3988	\$ 7.4486	\$ 8.2762	\$ 9.1038			
Nov-26	\$ 7.9481	\$ 8.8313	\$ 9.7144	\$ 7.4184	\$ 8.2426	\$ 9.0669	\$ 8.0729	\$ 8.9698	\$ 9.8668	\$ 7.8006	\$ 8.6673	\$ 9.5341			
Dec-26	\$ 7.9895	\$ 8.8773	\$ 9.7650	\$ 7.4766	\$ 8.3073	\$ 9.1380	\$ 8.0771	\$ 8.9745	\$ 9.8720	\$ 7.8083	\$ 8.6759	\$ 9.5435			
Jan-27	\$ 7.8131	\$ 8.6812	\$ 9.5493	\$ 7.3652	\$ 8.1836	\$ 9.0019	\$ 8.2652	\$ 9.1836	\$ 10.1019	\$ 7.9249	\$ 8.8054	\$ 9.6859			
Feb-27	\$ 7.8458	\$ 8.7176	\$ 9.5894	\$ 7.4067	\$ 8.2297	\$ 9.0527	\$ 8.2871	\$ 9.2079	\$ 10.1286	\$ 7.9708	\$ 8.8564	\$ 9.7421			
Mar-27	\$ 7.9261	\$ 8.8068	\$ 9.6874	\$ 7.4013	\$ 8.2237	\$ 9.0460	\$ 8.3297	\$ 9.2553	\$ 10.1808	\$ 8.0119	\$ 8.9021	\$ 9.7923			
Apr-27	\$ 7.8822	\$ 8.7579	\$ 9.6337	\$ 7.2226	\$ 8.0251	\$ 8.8277	\$ 8.1235	\$ 9.0261	\$ 9.9287	\$ 7.8370	\$ 8.7077	\$ 9.5785			
May-27	\$ 7.6040	\$ 8.4489	\$ 9.2938	\$ 6.9348	\$ 7.7053	\$ 8.4758	\$ 7.9812	\$ 8.8680	\$ 9.7548	\$ 7.7442	\$ 8.6046	\$ 9.4651			
Jun-27	\$ 7.5658	\$ 8.4065	\$ 9.2471	\$ 6.9713	\$ 7.7459	\$ 8.5205	\$ 7.9977	\$ 8.8863	\$ 9.7750	\$ 7.7402	\$ 8.6003	\$ 9.4603			
Jul-27	\$ 7.6107	\$ 8.4564	\$ 9.3020	\$ 7.0054	\$ 7.7838	\$ 8.5622	\$ 8.0381	\$ 8.9313	\$ 9.8244	\$ 7.7714	\$ 8.6349	\$ 9.4984			
Aug-27	\$ 7.6346	\$ 8.4829	\$ 9.3312	\$ 7.0349	\$ 7.8166	\$ 8.5982	\$ 8.0800	\$ 8.9778	\$ 9.8755	\$ 7.8008	\$ 8.6676	\$ 9.5343			
Sep-27	\$ 7.6690	\$ 8.5211	\$ 9.3732	\$ 7.0845	\$ 7.8716	\$ 8.6588	\$ 8.1308	\$ 9.0342	\$ 9.9376	\$ 7.8482	\$ 8.7202	\$ 9.5922			
Oct-27	\$ 7.7010	\$ 8.5567	\$ 9.4124	\$ 7.1580	\$ 7.9534	\$ 8.7487	\$ 8.1706	\$ 9.0784	\$ 9.9863	\$ 7.8830	\$ 8.7588	\$ 9.6347			
Nov-27	\$ 7.9897	\$ 8.8775	\$ 9.7652	\$ 7.5417	\$ 8.3796	\$ 9.2176	\$ 8.5191	\$ 9.4657	\$ 10.4123	\$ 8.1838	\$ 9.0931	\$ 10.0024			
Dec-27	\$ 8.1545	\$ 9.0606	\$ 9.9666	\$ 7.7034	\$ 8.5594	\$ 9.4153	\$ 8.6342	\$ 9.5936	\$ 10.5530	\$ 8.2799	\$ 9.1999	\$ 10.1199			
Jan-28	\$ 8.1086	\$ 9.0095	\$ 9.9105	\$ 7.6562	\$ 8.5069	\$ 9.3576	\$ 8.5652	\$ 9.5169	\$ 10.4686	\$ 8.2215	\$ 9.1350	\$ 10.0485			
Feb-28	\$ 8.1426	\$ 9.0473	\$ 9.9520	\$ 7.6991	\$ 8.5546	\$ 9.4100	\$ 8.5882	\$ 9.5425	\$ 10.4967	\$ 8.2688	\$ 9.1875	\$ 10.1063			
Mar-28	\$ 8.2259	\$ 9.1399	\$ 10.0538	\$ 7.6958	\$ 8.5509	\$ 9.4060	\$ 8.6335	\$ 9.5928	\$ 10.5521	\$ 8.3125	\$ 9.2361	\$ 10.1597			
Apr-28	\$ 8.1803	\$ 9.0892	\$ 9.9981	\$ 7.5141	\$ 8.3491	\$ 9.1840	\$ 8.4240	\$ 9.3600	\$ 10.2960	\$ 8.1346	\$ 9.0385	\$ 9.9423			
May-28	\$ 7.8916	\$ 8.7684	\$ 9.6453	\$ 7.2157	\$ 8.0174	\$ 8.8191	\$ 8.2726	\$ 9.1918	\$ 10.1109	\$ 8.0332	\$ 8.9257	\$ 9.8183			
Jun-28	\$ 7.8520	\$ 8.7244	\$ 9.5969	\$ 7.2515	\$ 8.0572	\$ 8.8630	\$ 8.2882	\$ 9.2091	\$ 10.1300	\$ 8.0281	\$ 8.9201	\$ 9.8122			
Jul-28	\$ 7.8986	\$ 8.7762	\$ 9.6538	\$ 7.2872	\$ 8.0969	\$ 8.9066	\$ 8.3303	\$ 9.2558	\$ 10.1814	\$ 8.0609	\$ 8.9565	\$ 9.8522			
Aug-28	\$ 7.9233	\$ 8.8037	\$ 9.6841	\$ 7.3177	\$ 8.1307	\$ 8.9438	\$ 8.3732	\$ 9.3035	\$ 10.2339	\$ 8.0912	\$ 8.9902	\$ 9.8893			
Sep-28	\$ 7.9590	\$ 8.8433	\$ 9.7277	\$ 7.3687	\$ 8.1874	\$ 9.0062	\$ 8.4255	\$ 9.3616	\$ 10.2978	\$ 8.1400	\$ 9.0445	\$ 9.9489			
Oct-28	\$ 7.9923	\$ 8.8803	\$ 9.7684	\$ 7.4439	\$ 8.2709	\$ 9.0980	\$ 8.4665	\$ 9.4073	\$ 10.3480	\$ 8.1760	\$ 9.0845	\$ 9.9999			

CASCADE NATURAL GAS-- PRICE FORECAST EXHIBIT
(\$2008)

	Henry Hub			Rockies			Gas Supply			Sumas			AECO		
	Hub Price	Hub Price	Hub Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)	(LOW)	(BASE)	(HIGH)
Nov-28	\$ 8.2919	\$ 9.2132	\$10.1345	\$ 7.8394	\$ 8.7104	\$ 9.5815	\$ 8.8266	\$ 9.8073	\$10.7881	\$ 8.4879	\$ 9.4310	\$10.3742			
Dec-28	\$ 8.4629	\$ 9.4032	\$10.3436	\$ 8.0073	\$ 8.8970	\$ 9.7867	\$ 8.9474	\$ 9.9416	\$10.9358	\$ 8.5896	\$ 9.5440	\$10.4984			
Jan-29	\$ 8.3450	\$ 9.2722	\$10.1994	\$ 7.8881	\$ 8.7646	\$ 9.6410	\$ 8.8062	\$ 9.7847	\$10.7631	\$ 8.4590	\$ 9.3989	\$10.3388			
Feb-29	\$ 8.3800	\$ 9.3111	\$10.2422	\$ 7.9321	\$ 8.8134	\$ 9.6947	\$ 8.8301	\$ 9.8112	\$10.7923	\$ 8.5074	\$ 9.4527	\$10.3980			
Mar-29	\$ 8.4657	\$ 9.4063	\$10.3470	\$ 7.9303	\$ 8.8115	\$ 9.6926	\$ 8.8774	\$ 9.8638	\$10.8502	\$ 8.5532	\$ 9.5036	\$10.4539			
Apr-29	\$ 8.4188	\$ 9.3542	\$10.2896	\$ 7.7460	\$ 8.6066	\$ 9.4673	\$ 8.6650	\$ 9.6277	\$10.5905	\$ 8.3727	\$ 9.3030	\$10.2333			
May-29	\$ 8.1217	\$ 9.0241	\$ 9.9265	\$ 7.4390	\$ 8.2655	\$ 9.0921	\$ 8.5065	\$ 9.4516	\$10.3968	\$ 8.2647	\$ 9.1829	\$10.1012			
Jun-29	\$ 8.0809	\$ 8.9788	\$ 9.8767	\$ 7.4744	\$ 8.3049	\$ 9.1354	\$ 8.5214	\$ 9.4683	\$10.4151	\$ 8.2588	\$ 9.1765	\$10.0941			
Jul-29	\$ 8.1289	\$ 9.0321	\$ 9.9353	\$ 7.5114	\$ 8.3460	\$ 9.1806	\$ 8.5649	\$ 9.5165	\$10.4682	\$ 8.2928	\$ 9.2142	\$10.1356			
Aug-29	\$ 8.1543	\$ 9.0604	\$ 9.9664	\$ 7.5426	\$ 8.3807	\$ 9.2187	\$ 8.6087	\$ 9.5652	\$10.5217	\$ 8.3239	\$ 9.2488	\$10.1737			
Sep-29	\$ 8.1910	\$ 9.1012	\$10.0113	\$ 7.5948	\$ 8.4387	\$ 9.2825	\$ 8.6622	\$ 9.6246	\$10.5871	\$ 8.3739	\$ 9.3043	\$10.2347			
Oct-29	\$ 8.2253	\$ 9.1393	\$10.0532	\$ 7.6714	\$ 8.5238	\$ 9.3761	\$ 8.7043	\$ 9.6714	\$10.6386	\$ 8.4109	\$ 9.3454	\$10.2800			
Nov-29	\$ 8.5336	\$ 9.4818	\$10.4300	\$ 8.0766	\$ 8.9740	\$ 9.8714	\$ 9.0737	\$10.0819	\$11.0901	\$ 8.7317	\$ 9.7018	\$10.6720			
Dec-29	\$ 8.7097	\$ 9.6774	\$10.6451	\$ 8.2495	\$ 9.1661	\$10.0827	\$ 9.1990	\$10.2211	\$11.2433	\$ 8.8376	\$ 9.8195	\$10.8015			
Jan-30	\$ 8.5341	\$ 9.4823	\$10.4306	\$ 8.0727	\$ 8.9696	\$ 9.8666	\$ 8.9999	\$ 9.9999	\$10.9999	\$ 8.6493	\$ 9.6103	\$10.5713			
Feb-30	\$ 8.5699	\$ 9.5221	\$10.4743	\$ 8.1175	\$ 9.0194	\$ 9.9214	\$ 9.0245	\$10.0272	\$11.0299	\$ 8.6986	\$ 9.6651	\$10.6316			
Mar-30	\$ 8.6575	\$ 9.6195	\$10.5814	\$ 8.1168	\$ 9.0187	\$ 9.9206	\$ 9.0734	\$10.0816	\$11.0897	\$ 8.7459	\$ 9.7177	\$10.6895			
Apr-30	\$ 8.6096	\$ 9.5662	\$10.5228	\$ 7.9300	\$ 8.8112	\$ 9.6923	\$ 8.8582	\$ 9.8425	\$10.8267	\$ 8.5630	\$ 9.5144	\$10.4659			
May-30	\$ 8.3057	\$ 9.2286	\$10.1514	\$ 7.6162	\$ 8.4625	\$ 9.3087	\$ 8.6944	\$ 9.6604	\$10.6265	\$ 8.4501	\$ 9.3890	\$10.3280			
Jun-30	\$ 8.2641	\$ 9.1823	\$10.1005	\$ 7.6515	\$ 8.5017	\$ 9.3518	\$ 8.7090	\$ 9.6767	\$10.6443	\$ 8.4437	\$ 9.3819	\$10.3201			
Jul-30	\$ 8.3131	\$ 9.2368	\$10.1604	\$ 7.6894	\$ 8.5438	\$ 9.3982	\$ 8.7534	\$ 9.7260	\$10.6986	\$ 8.4786	\$ 9.4207	\$10.3628			
Aug-30	\$ 8.3391	\$ 9.2657	\$10.1923	\$ 7.7213	\$ 8.5792	\$ 9.4371	\$ 8.7980	\$ 9.7756	\$10.7531	\$ 8.5104	\$ 9.4560	\$10.4016			
Sep-30	\$ 8.3767	\$ 9.3074	\$10.2382	\$ 7.7745	\$ 8.6383	\$ 9.5021	\$ 8.8525	\$ 9.8361	\$10.8197	\$ 8.5613	\$ 9.5126	\$10.4638			
Oct-30	\$ 8.4117	\$ 9.3464	\$10.2810	\$ 7.8522	\$ 8.7247	\$ 9.5972	\$ 8.8955	\$ 9.8839	\$10.8723	\$ 8.5991	\$ 9.5546	\$10.5101			
Nov-30	\$ 8.7270	\$ 9.6967	\$10.6664	\$ 8.2654	\$ 9.1838	\$10.1022	\$ 9.2725	\$10.3028	\$11.3330	\$ 8.9270	\$ 9.9189	\$10.9108			
Dec-30	\$ 8.9070	\$ 9.8967	\$10.8864	\$ 8.4423	\$ 9.3803	\$10.3184	\$ 9.4013	\$10.4459	\$11.4905	\$ 9.0362	\$10.0403	\$11.0443			

Appendix F
Capacity Requirements & Peak Day Planning

Peak Day Demand & Existing Capacity Resources Estimated Shortfall For All Forecasts



Note: WGPW Capacity is net of Non-Core primary term capacity requirements

Cascade Natural Gas Corporation
Transportation Capacity vs Peak Requirements
Medium Load Growth Forecast

(000's of Therms)

	Counter Party	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CAPACITY REQUIREMENTS (@ 65 DD)																								
Non-Core Primary Term		419	419	418	412	330	267	229	191	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Core Capacity Requirement		3,328	3,392	3,461	3,537	3,619	3,705	3,791	3,878	3,964	4,052	4,139	4,227	4,314	4,402	4,489	4,576	4,663	4,750	4,837	4,925	5,013	5,102	5,189
Total Required Firm Capacity		3,747	3,811	3,879	3,949	3,949	3,972	4,020	4,069	3,964	4,052	4,139	4,227	4,314	4,402	4,489	4,576	4,663	4,750	4,837	4,925	5,013	5,102	5,189
CAPACITY RESOURCES																								
Current TF-1 *		Williams Gas Pipeline West	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061
Supplemental TF-1 (Kitsap)		Williams Gas Pipeline West	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
Supplemental TF-1 (Weyerhaeuser)		Williams Gas Pipeline West	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
NWP Phase 1		Williams Gas Pipeline West	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
SGS-1 (STORAGE)		Williams Gas Pipeline West	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
JP EXPANSION		Williams Gas Pipeline West	-	-	-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
LS-1 (STORAGE)		Williams Gas Pipeline West	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
GTN FTS-1 **		Gas Transmission NW	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
GTN T-3 (Nov - Apr)		Gas Transmission NW	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
GTN SUPPLEMENTAL (Nov - Apr) **		Gas Transmission NW	36	36	36	36	36	36	36	36	36	-	-	-	-	-	-	-	-	-	-	-	-	-
GTN 03 EXPANSION (Nov - Apr) **		Gas Transmission NW	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Total Capacity Available			3,722	3,722	3,722	4,022	4,022	4,022	4,022	4,022	4,022	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	
CAPACITY BALANCE																								
Capacity For Release			(25)	(89)																				
Incremental Capacity Required			-	-	157	(73)	(73)	(50)	(1)	47	(57)	30	153	241	328	416	503	590	677	764	852	939	1,027	1,104

* 280/day is via Cascade's GTN FTS-1 contract. The TF-1 contract also includes 200 Upstream at Station 2 on Duke Energy Transmission (Formerly Westcoast) beginning Nov. 1, 2003.

** Includes Annual (12 Months) Upstream Capacity on TransCanada Pipeline (NOVA and ANG)

Cascade Natural Gas Corporation
Transportation Capacity vs Peak Requirements
Medium Load Growth Forecast
 (000's of Therms)

	Counter Party	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
SUMMARY BY PIPELINE																									
Core Peak Load @ 65 dd system wide																									
NWP Load		2,766	2,818	2,869	2,926	2,986	3,047	3,107	3,169	3,230	3,291	3,353	3,415	3,478	3,539	3,601	3,662	3,725	3,787	3,848	3,910	3,973	4,036	4,098	
GTN Load		561	575	592	612	634	658	684	709	734	760	785	811	836	861	887	912	938	964	989	1,015	1,041	1,066	1,091	
Total System Core Requirements		3,327	3,393	3,461	3,538	3,620	3,705	3,791	3,878	3,964	4,051	4,138	4,226	4,314	4,400	4,488	4,574	4,663	4,751	4,837	4,925	5,014	5,102	5,189	
GTN		624	624	624	624	624	624	624	624	624	624	588	588	588	588	588	588	588	588	588	588	588	588	588	
NWP		3,098	3,098	3,098	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	
		3,722	3,722	3,722	4,022	4,022	4,022	4,022	4,022	4,022	4,022	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	
NWP Excess/(Shortfall)		(87)	(139)	(189)	60	82	84	62	38	168	107	45	(17)	(80)	(141)	(203)	(264)	(327)	(389)	(450)	(512)	(575)	(638)	(700)	
GTN Excess/(Shortfall)		63	49	32	12	(10)	(34)	(60)	(85)	(110)	(136)	(197)	(223)	(248)	(273)	(299)	(324)	(350)	(376)	(401)	(427)	(453)	(478)	(503)	
Total System Excess/(Shortfall)		(24)	(90)	(157)	72	72	50	2	(47)	58	(29)	(152)	(240)	(328)	(414)	(502)	(588)	(677)	(765)	(851)	(939)	(1,028)	(1,116)	(1,203)	

Cascade Natural Gas Corporation
Transportation Capacity vs Peak Requirements
Low Load Growth Forecast

(000's of Therms)

	Counter Party	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
SUMMARY BY PIPELINE																									
Core Peak Load @ 65 dd system wide																									
NWP Load		2,738	2,757	2,777	2,800	2,824	2,848	2,871	2,893	2,914	2,935	2,955	2,975	2,994	3,013	3,030	3,047	3,063	3,078	3,093	3,107	3,121	3,136	3,149	
GTN Load		555	565	577	591	607	624	640	656	672	687	702	716	730	744	758	771	784	796	809	821	832	843	853	
Total System Core Requirements		3,294	3,322	3,354	3,392	3,432	3,472	3,511	3,550	3,586	3,622	3,657	3,691	3,725	3,757	3,788	3,818	3,847	3,875	3,902	3,928	3,954	3,978	4,002	
GTN		624	624	624	624	624	624	624	624	624	624	588	588	588	588	588	588	588	588	588	588	588	588	588	
NWP		3,098	3,098	3,098	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398	
		3,722	3,722	3,722	4,022	4,022	4,022	4,022	4,022	4,022	4,022	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	
NWP Excess/(Shortfall)		(59)	(78)	(97)	186	244	283	298	314	484	463	443	423	404	385	368	351	335	320	305	291	276	262	249	
GTN Excess/(Shortfall)		68	59	46	32	16	(0)	(16)	(32)	(48)	(63)	(114)	(129)	(143)	(156)	(170)	(183)	(196)	(209)	(221)	(233)	(244)	(255)	(265)	
Total System Excess/(Shortfall)		9	(19)	(50)	218	260	283	282	281	436	400	329	295	261	229	198	168	139	111	84	58	32	7	(16)	

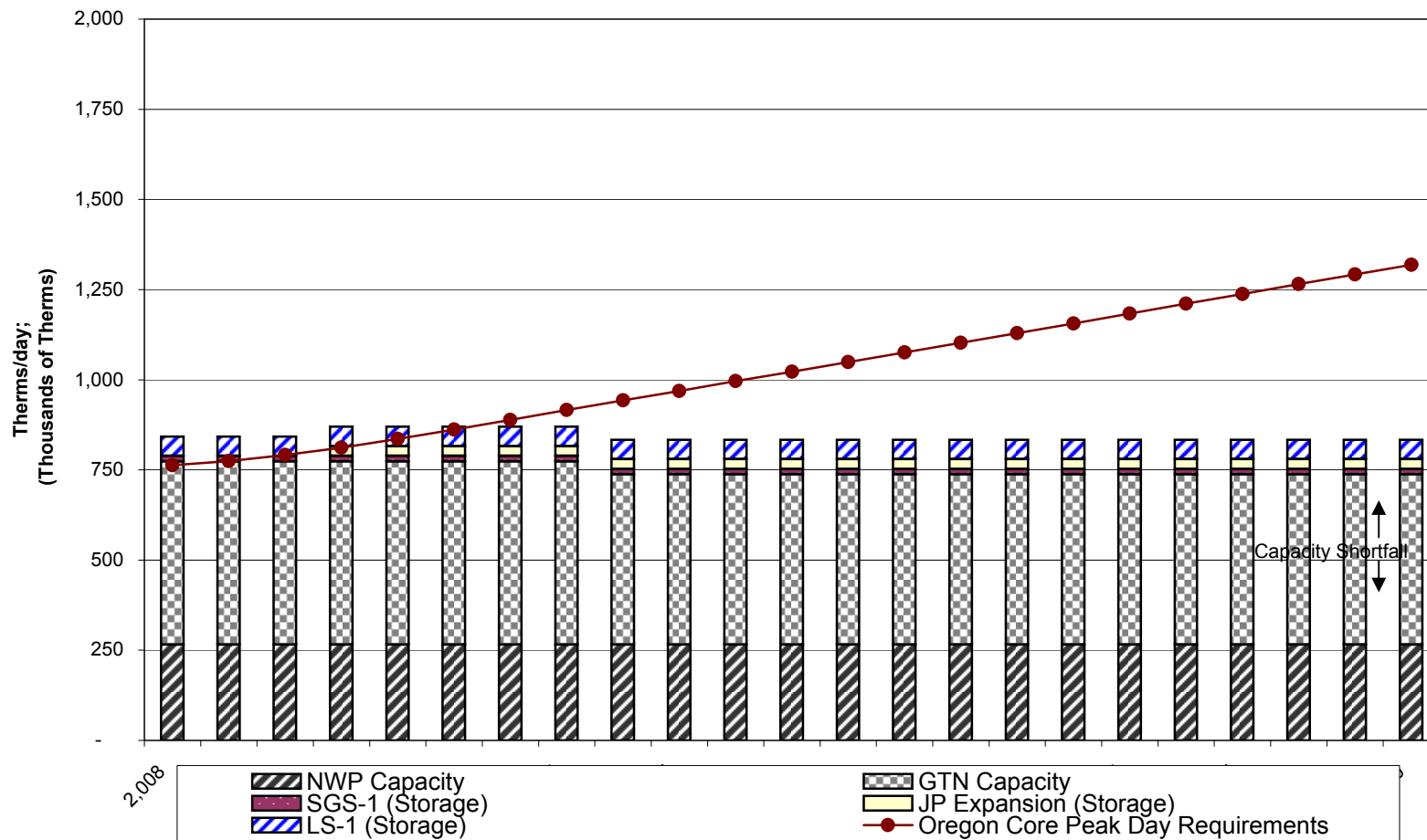
Cascade Natural Gas Corporation
Transportation Capacity vs Peak Requirements
High Load Growth Forecast
(000's of Therms)

	Counter Party	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CAPACITY REQUIREMENTS (@ 65 DD)																								
Non-Core Primary Term		419	419	418	412	330	267	229	191	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Core Capacity Requirement		3,360	3,466	3,579	3,702	3,831	3,965	4,100	4,240	4,381	4,525	4,674	4,824	4,979	5,136	5,297	5,460	5,627	5,796	5,970	6,147	6,328	6,512	6,700
Total Required Firm Capacity		3,779	3,885	3,997	4,114	4,161	4,232	4,329	4,431	4,381	4,525	4,674	4,824	4,979	5,136	5,297	5,460	5,627	5,796	5,970	6,147	6,328	6,512	6,700
CAPACITY RESOURCES																								
Current TF-1 *	Williams Gas Pipeline West	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061	2,061
Supplemental TF-1 (Kitsap)	Williams Gas Pipeline West	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
Supplemental TF-1 (Weyerhaeuser)	Williams Gas Pipeline West	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
NWP Phase 1	Williams Gas Pipeline West	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
SGS-1 (STORAGE)	Williams Gas Pipeline West	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
JP EXPANSION	Williams Gas Pipeline West	-	-	-	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
LS-1 (STORAGE)	Williams Gas Pipeline West	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
GTN FTS-1 **	Gas Transmission NW	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
GTN T-3 (Nov - Apr)	Gas Transmission NW	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
GTN SUPPLEMENTAL (Nov - Apr) **	Gas Transmission NW	36	36	36	36	36	36	36	36	36	36	-	-	-	-	-	-	-	-	-	-	-	-	-
GTN 03 EXPANSION (Nov - Apr) **	Gas Transmission NW	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Total Capacity Available		3,722	3,722	3,722	4,022	4,022	4,022	4,022	4,022	4,022	4,022	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986	3,986
CAPACITY BALANCE																								
Capacity For Release		(58)																						
Incremental Capacity Required		-	164	276	92	139	210	308	409	359	504	688	838	993	1,151	1,311	1,474	1,641	1,811	1,984	2,161	2,342	2,526	2,714

* 280/day is via Cascade's GTN FTS-1 contract. The TF-1 contract also includes 200 Upstream at Station 2 on Duke Energy Transmission (Formerly Westcoast) beginning Nov. 1, 2003.

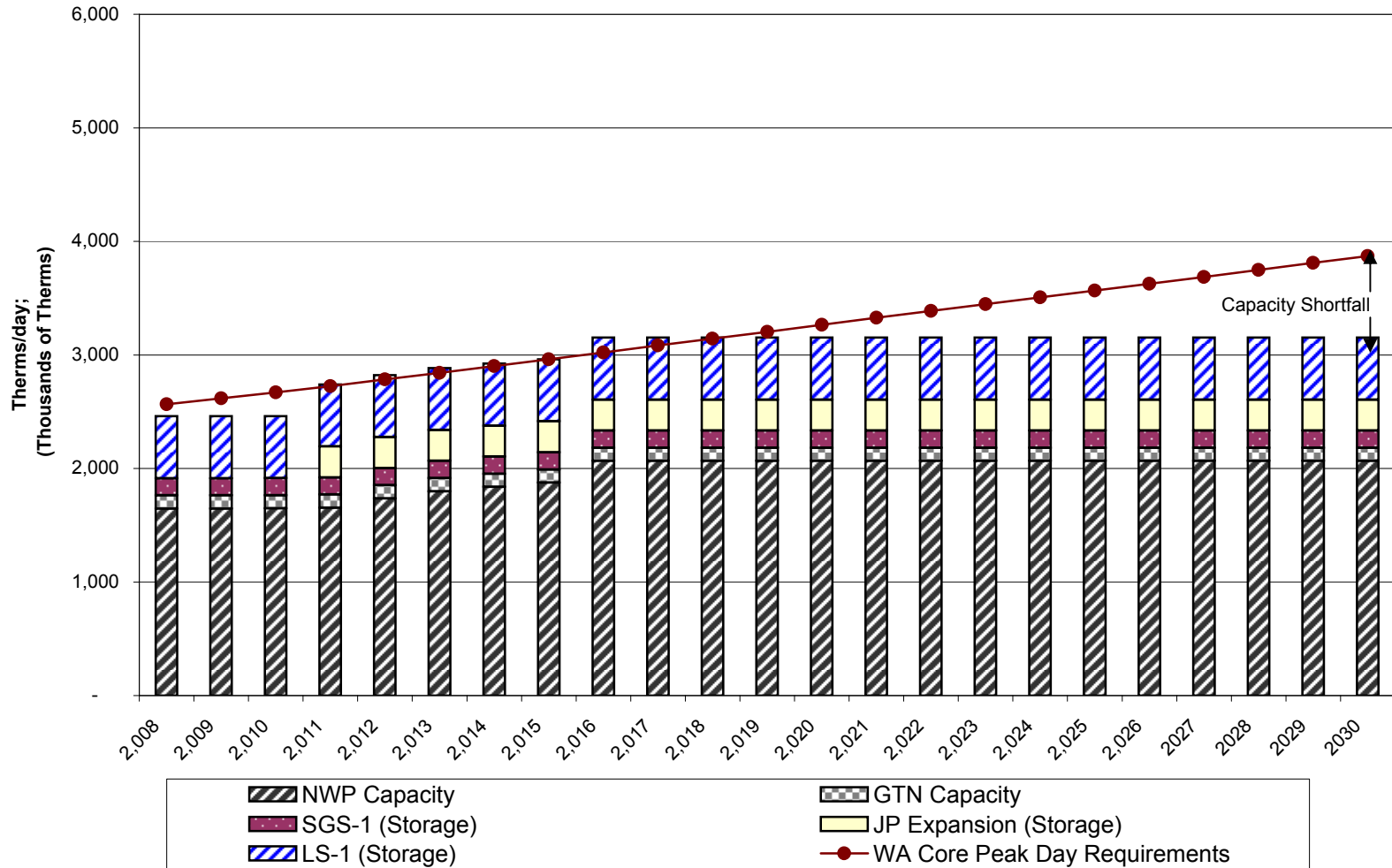
** Includes Annual (12 Months) Upstream Capacity on TransCanada Pipeline (NOVA and ANG)

OREGON Peak Day Demand & Existing Capacity Resources Medium Load Forecast



Note: WGPW Capacity is net of Non-Core primary term capacity requirements

WASHINGTON Peak Day Demand & Existing Capacity Resources Medium Load Forecast



Note: WGPW Capacity is net of Non-Core primary term capacity requirements. Citygate peaking supplies and short-term capacity releases are available to meet peak day requirements through 2010.

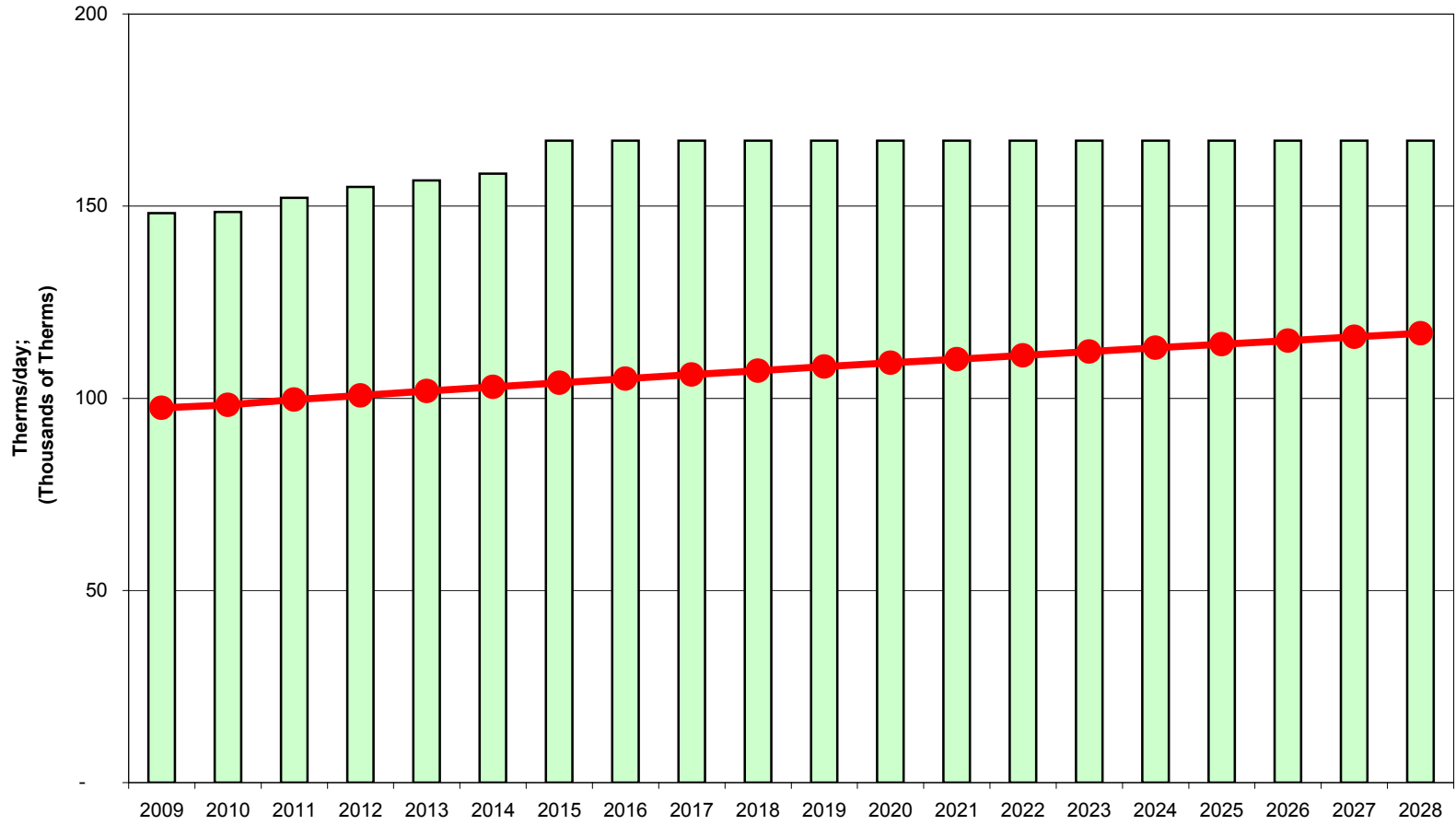
**Cascade Natural Gas Corporation
Transportation Capacity vs Peak Requirements
Existing Upstream Pipeline Capacity vs Zonal Peak Demand
(000s of therms)**

Medium Load Growth Forecast

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Zone 10	Zone Capacity	148	148	152	155	157	158	167	167	167	167	167	167	167	167	167	167	167	167	167	167
	Zone Core Requirements	98	98	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117
	Excess/(Shortfall)	51	50	53	54	55	55	63	62	61	60	59	58	57	56	55	54	53	52	51	50
Zone 11	Zone Capacity	349	350	358	365	369	373	393	393	393	393	393	393	393	393	393	393	393	393	393	393
	Zone Core Requirement	355	358	361	365	368	372	375	379	382	386	389	393	396	399	403	406	410	413	416	420
	Excess/(Shortfall)	(6)	(8)	(3)	0	1	1	18	15	11	8	4	1	(3)	(6)	(10)	(13)	(16)	(20)	(23)	(26)
Zone 20	Zone Capacity	577	578	592	603	610	616	649	649	649	649	649	649	649	649	649	649	649	649	649	649
	Zone Core Requirement	410	425	441	457	473	489	505	521	537	553	569	585	601	617	631	646	661	675	690	705
	Excess/(Shortfall)	168	154	151	146	137	127	144	128	112	96	80	64	48	33	18	3	(12)	(26)	(41)	(56)
Zone 24	Zone Capacity	135	135	138	141	142	144	152	152	152	152	152	152	152	152	152	152	152	152	152	152
	Zone Core Requirement	64	65	66	66	67	68	68	69	70	70	71	72	72	73	74	74	75	76	76	77
	Excess/(Shortfall)	71	70	73	75	75	76	83	83	82	81	81	80	79	79	78	78	77	76	76	75
Zone 26	Zone Capacity	465	466	476	484	489	494	518	518	518	518	518	518	518	518	518	518	518	518	518	518
	Zone Core Requirement	82	83	84	86	87	88	90	91	93	94	96	97	99	100	101	103	104	105	107	108
	Excess/(Shortfall)	383	383	392	398	402	405	428	427	425	424	422	421	419	418	417	415	414	413	411	410
Zone 30-S	Zone Capacity	545	546	554	561	564	568	588	588	588	588	588	588	588	588	588	588	588	588	588	588
	Zone Core Requirement	434	439	445	451	459	466	474	482	490	498	506	514	522	530	538	547	555	564	572	581
	Excess/(Shortfall)	111	106	109	109	106	102	114	106	98	90	82	74	66	58	49	41	33	24	16	7
Zone 30-W	Zone Capacity	979	981	1,005	1,024	1,035	1,047	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104
	Zone Core Requirement	1,015	1,040	1,066	1,093	1,120	1,147	1,175	1,202	1,229	1,257	1,285	1,314	1,342	1,371	1,399	1,428	1,456	1,485	1,514	1,543
	Excess/(Shortfall)	(36)	(59)	(61)	(69)	(85)	(101)	(71)	(98)	(126)	(154)	(182)	(210)	(239)	(267)	(296)	(324)	(353)	(382)	(410)	(439)
Zone GTN	Zone Capacity	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512
	Zone Core Requirement	575	592	612	634	658	684	709	734	760	785	811	836	861	887	912	938	964	989	1,015	1,041
	Excess/(Shortfall)	(63)	(80)	(100)	(122)	(146)	(172)	(197)	(222)	(248)	(273)	(298)	(324)	(349)	(375)	(400)	(426)	(452)	(477)	(503)	(529)
Zone ME-OR	Zone Capacity	237	238	244	248	251	254	268	268	268	268	268	268	268	268	268	268	268	268	268	268
	Zone Core Requirement	200	200	200	202	204	205	207	208	209	211	212	213	214	215	217	218	220	221	223	224
	Excess/(Shortfall)	37	38	44	47	48	49	60	59	58	57	56	54	54	52	51	49	48	46	45	43
Zone ME-WA	Zone Capacity	124	125	128	130	131	133	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	Zone Core Requirement	160	161	163	165	167	169	171	173	175	177	179	181	183	185	187	190	192	194	196	198
	Excess/(Shortfall)	(35)	(37)	(35)	(35)	(35)	(36)	(31)	(33)	(35)	(37)	(39)	(41)	(43)	(45)	(47)	(49)	(51)	(54)	(56)	(58)

Total Oregon	Zone Capacity	884	885	894	901	906	910	932	932	932	932	932	932	932	932	932	932	932	932	932	932
	Zone Core Requirement	839	856	877	902	929	957	985	1,012	1,039	1,067	1,094	1,121	1,148	1,175	1,203	1,231	1,258	1,286	1,314	1,342
	Excess/(Shortfall)	45	29	17	(1)	(23)	(47)	(53)	(80)	(107)	(135)	(162)	(190)	(216)	(244)	(271)	(299)	(327)	(355)	(383)	(411)
Total Wash.	Zone Capacity	3,188	3,194	3,266	3,322	3,356	3,390	3,559	3,559	3,559	3,559	3,559	3,559	3,559	3,559	3,559	3,559	3,559	3,559	3,559	3,559
	Zone Core Requirement	2,553	2,604	2,660	2,717	2,776	2,835	2,894	2,953	3,013	3,072	3,133	3,193	3,254	3,313	3,373	3,433	3,492	3,551	3,610	3,671
	Excess/(Shortfall)	636	589	606	605	580	555	665	606	546	486	426	366	305	246	186	126	67	8	(51)	(112)
Total System	TOT DELIVERY MDDOS	4,072	4,078	4,160	4,223	4,261	4,299	4,490	4,490	4,490	4,490	4,490	4,490	4,490	4,490	4,490	4,490	4,490	4,490	4,490	4,490
	TOT CORE DEMAND	3,392	3,461	3,537	3,619	3,705	3,791	3,878	3,964	4,052	4,139	4,227	4,314	4,402	4,489	4,576	4,663	4,750	4,837	4,925	5,013
	Excess/(Shortfall)	681	618	623	604	557	508	612	526	439	351	264	176	89	2	(85)	(173)	(260)	(347)	(434)	(523)

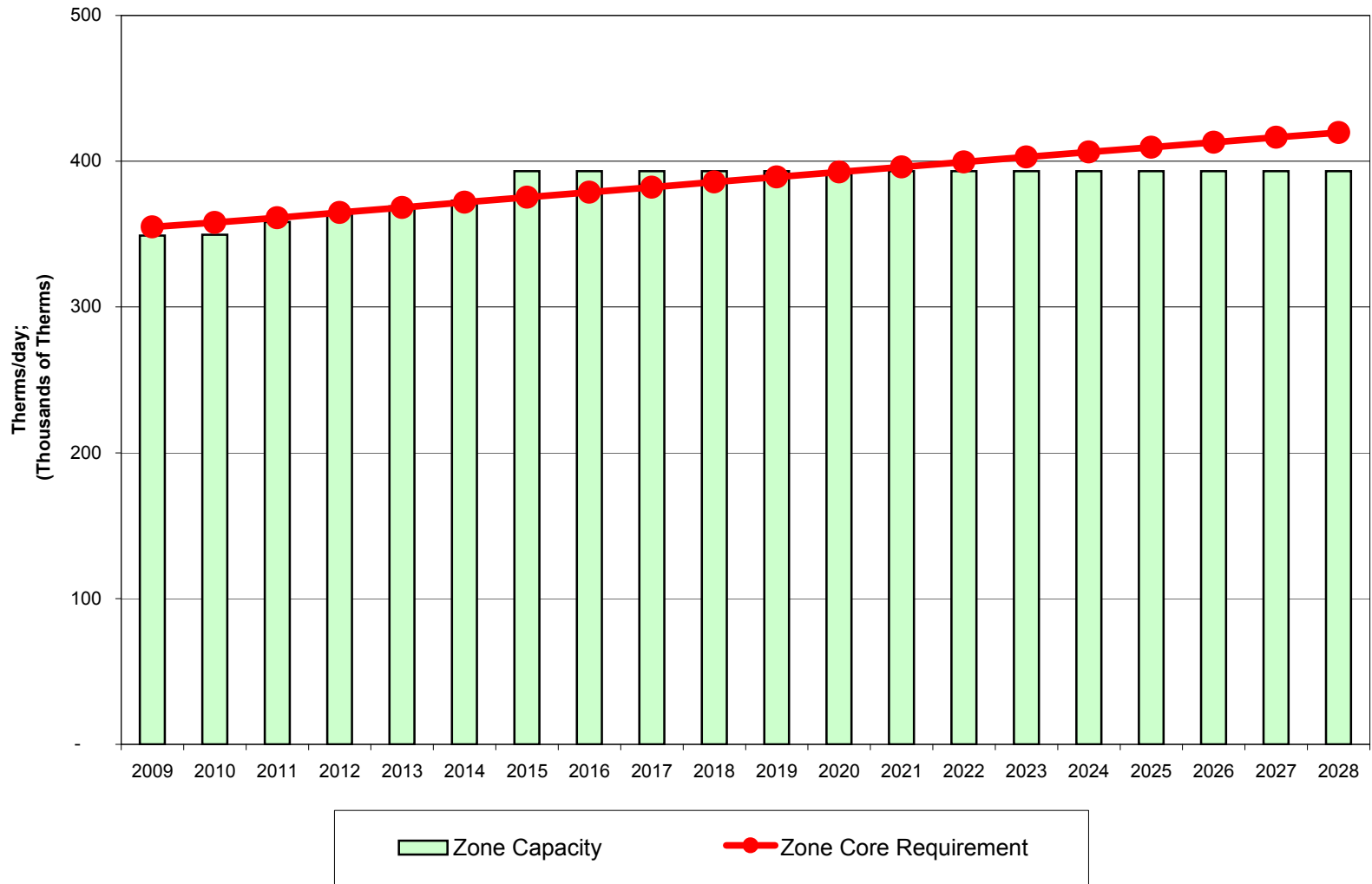
**ZONE 10 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



Zone Capacity
 Zone Core Requirement

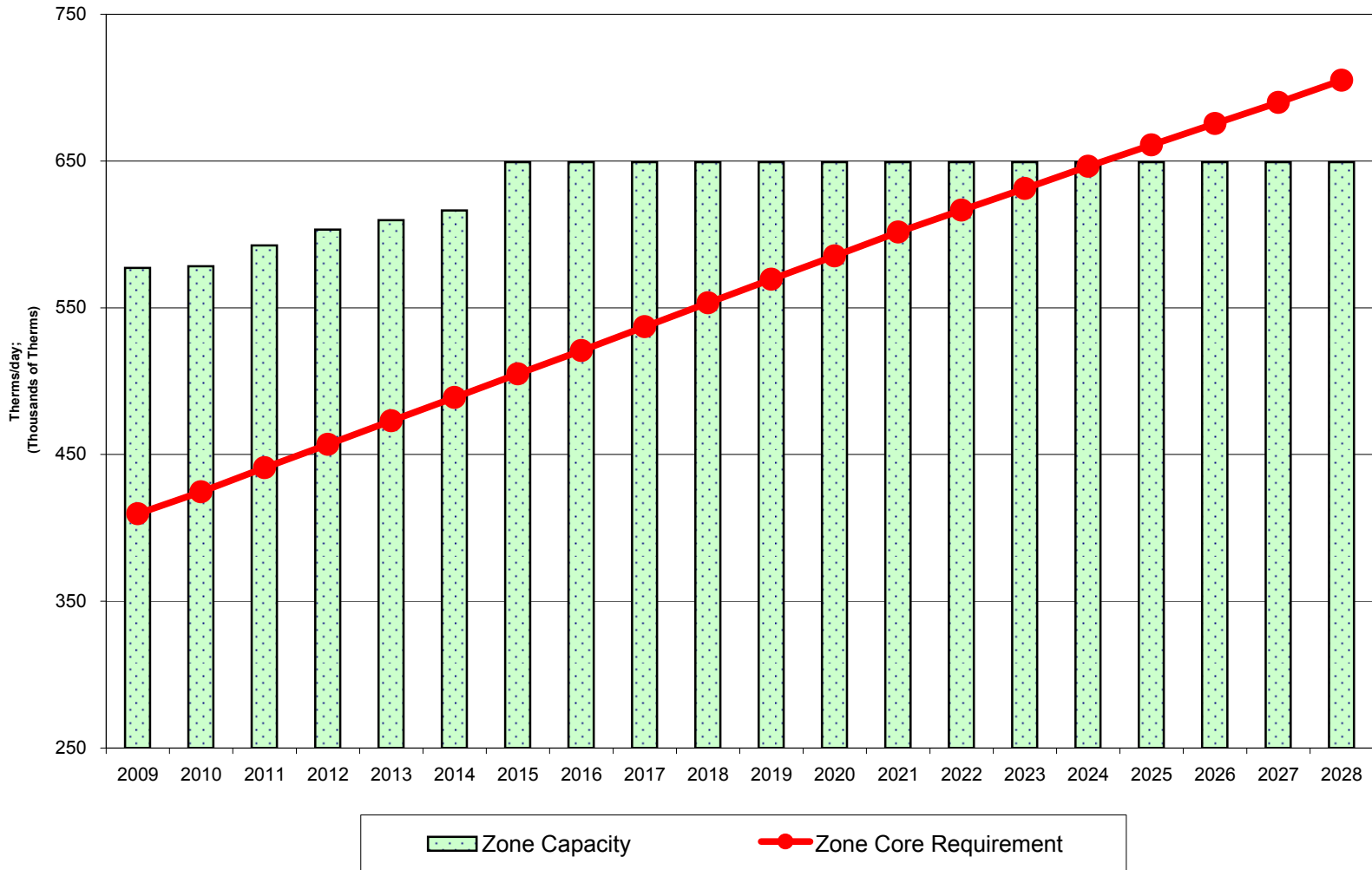
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

**ZONE 11 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



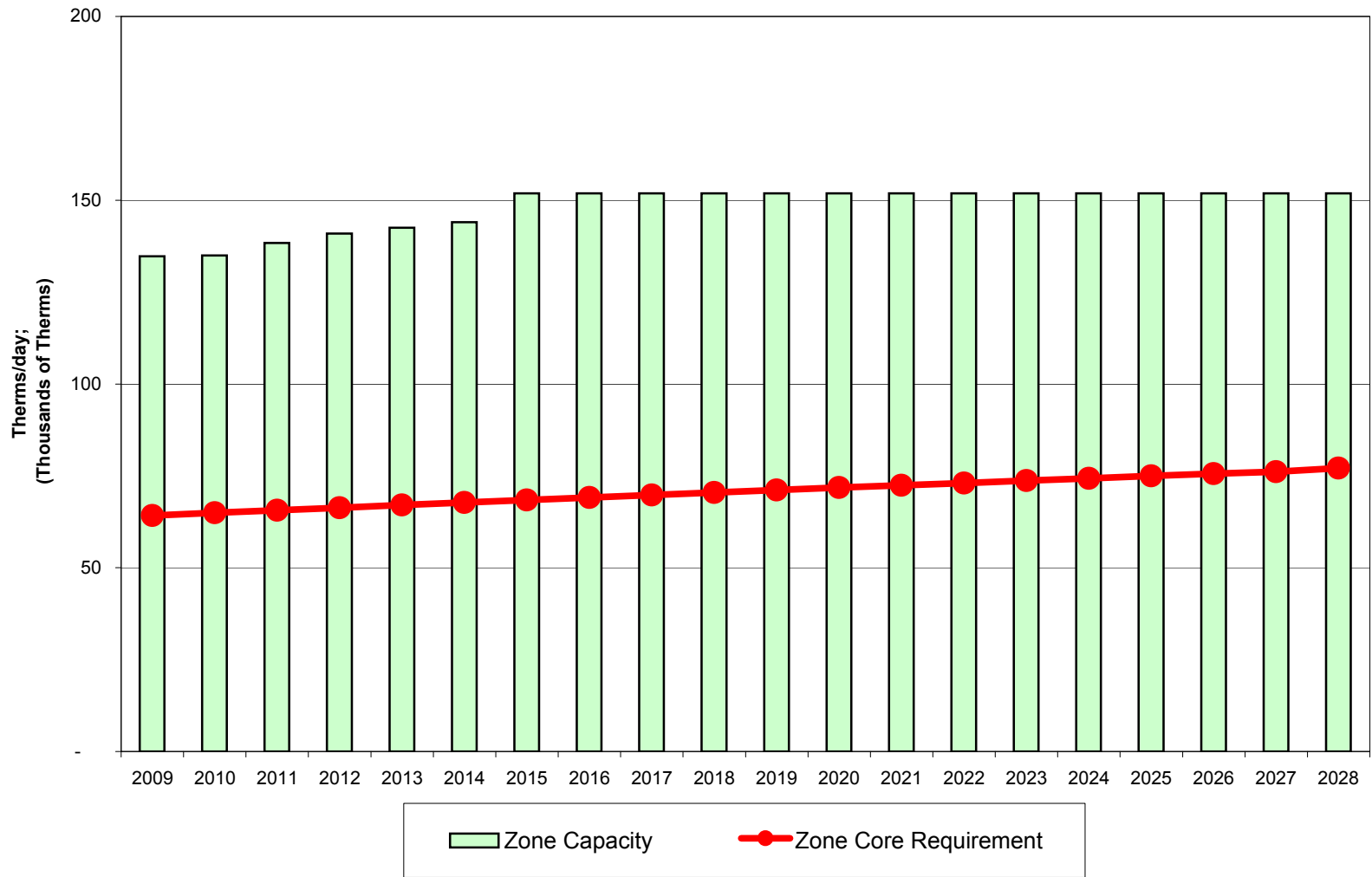
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

**ZONE 20 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



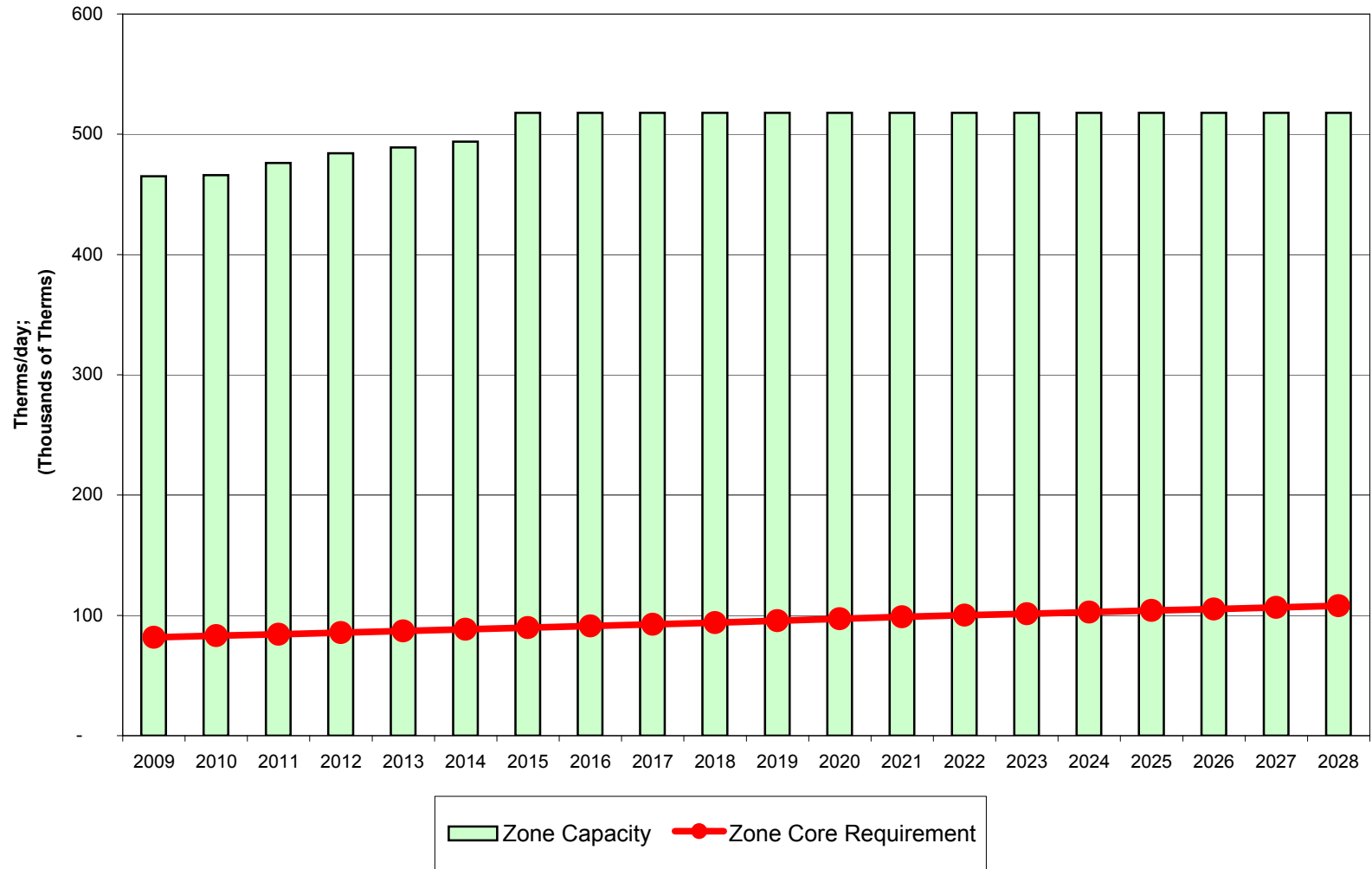
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

**ZONE 24 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



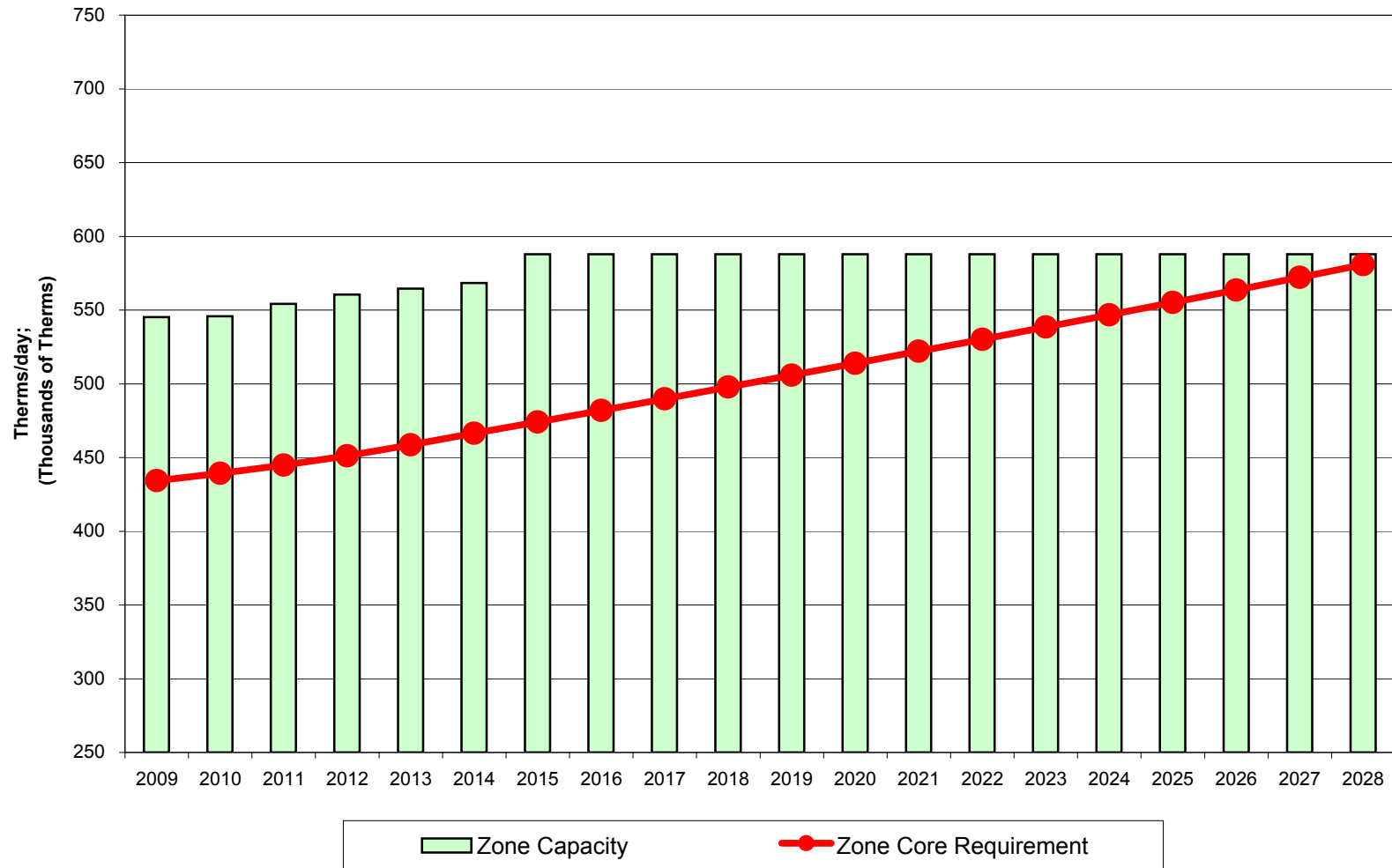
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

ZONE 26 Peak Day Demand & Existing Capacity Resources Medium Load Forecast



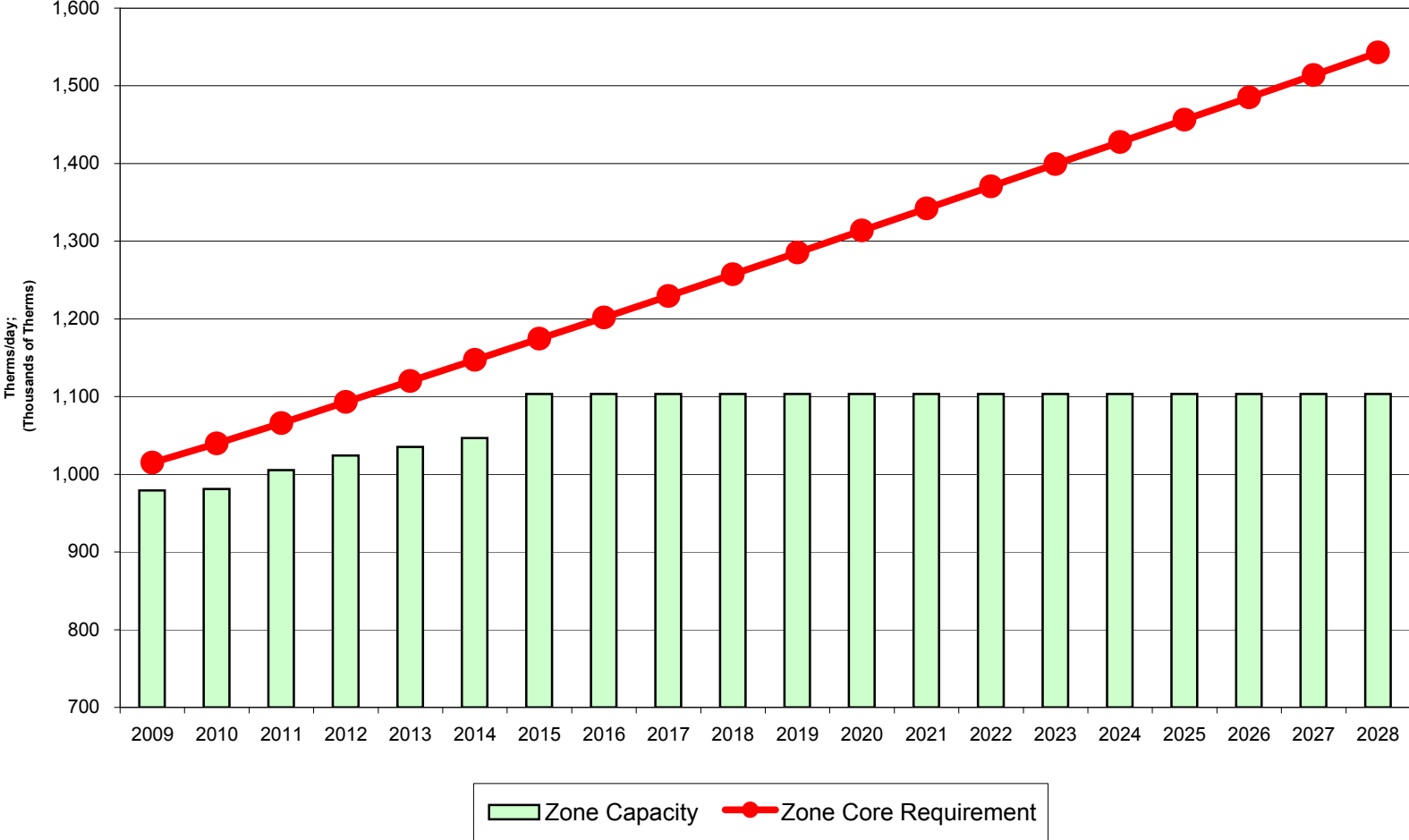
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

**ZONE 30-S Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



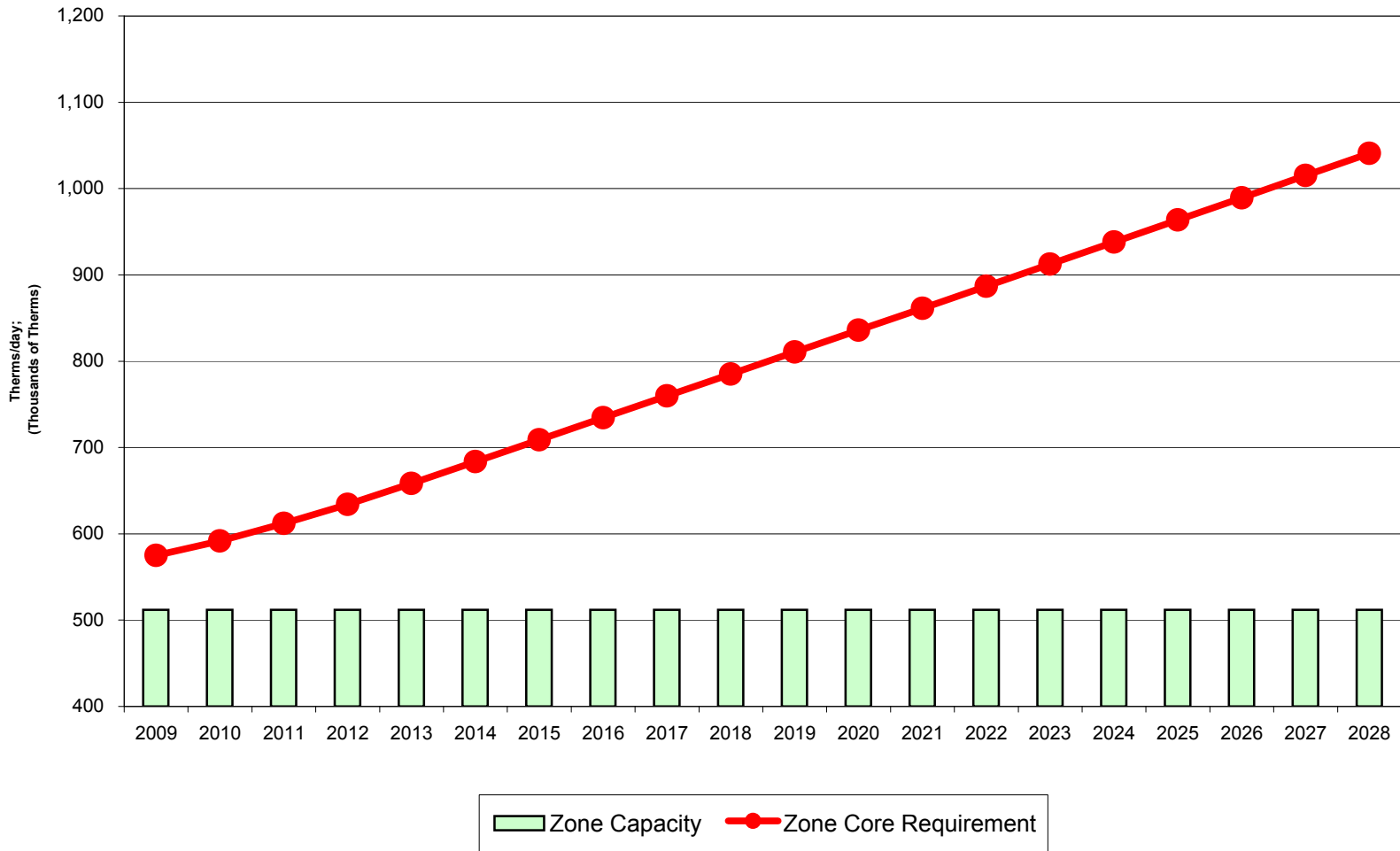
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

**ZONE 30-W Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



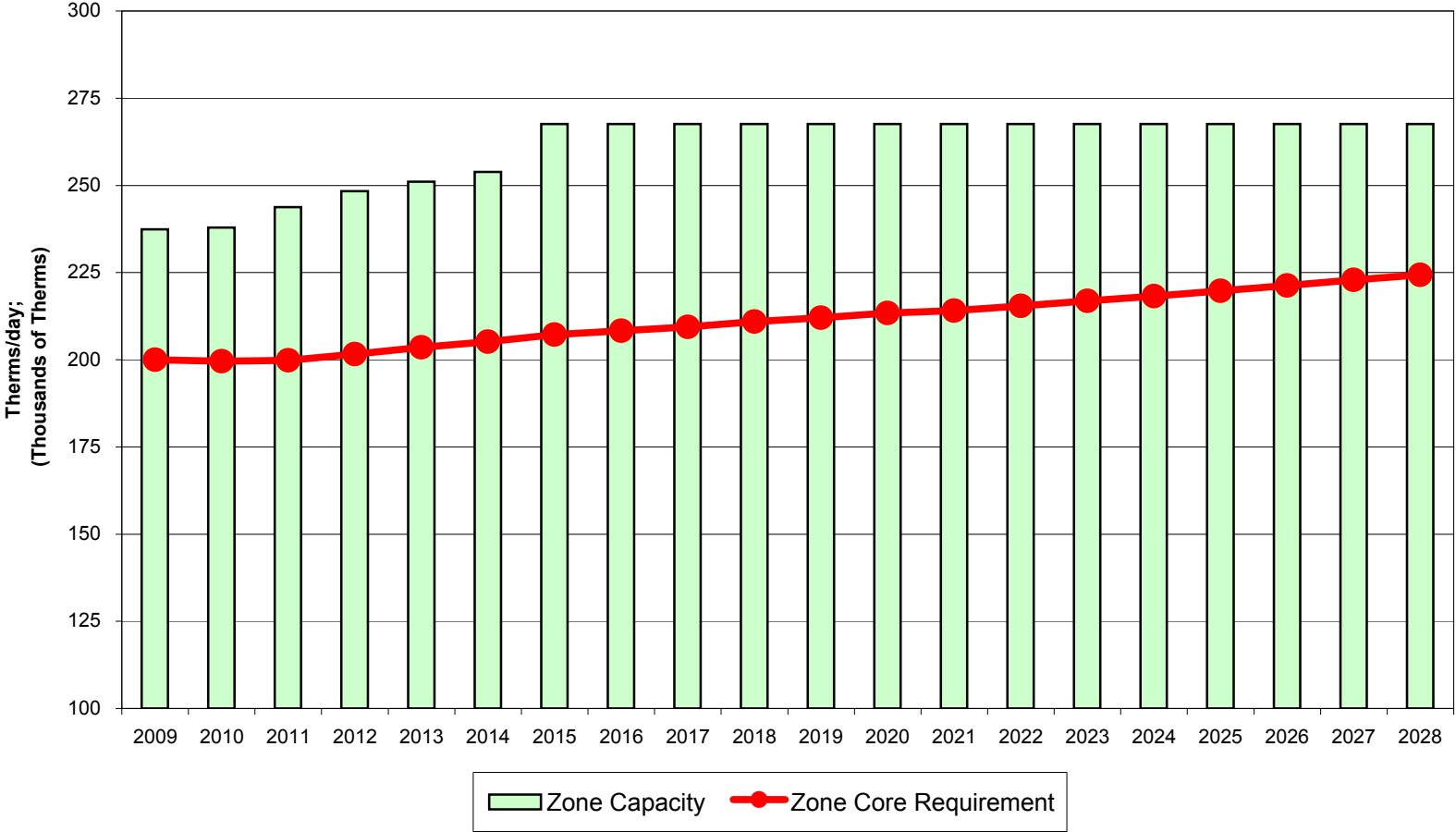
Note: WGPW Capacity is net of Non-Core primary term capacity requirements. Citygate peaking supplies and short-term capacity releases are available to meet peak day requirements through 2010.

**ZONE GTN Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



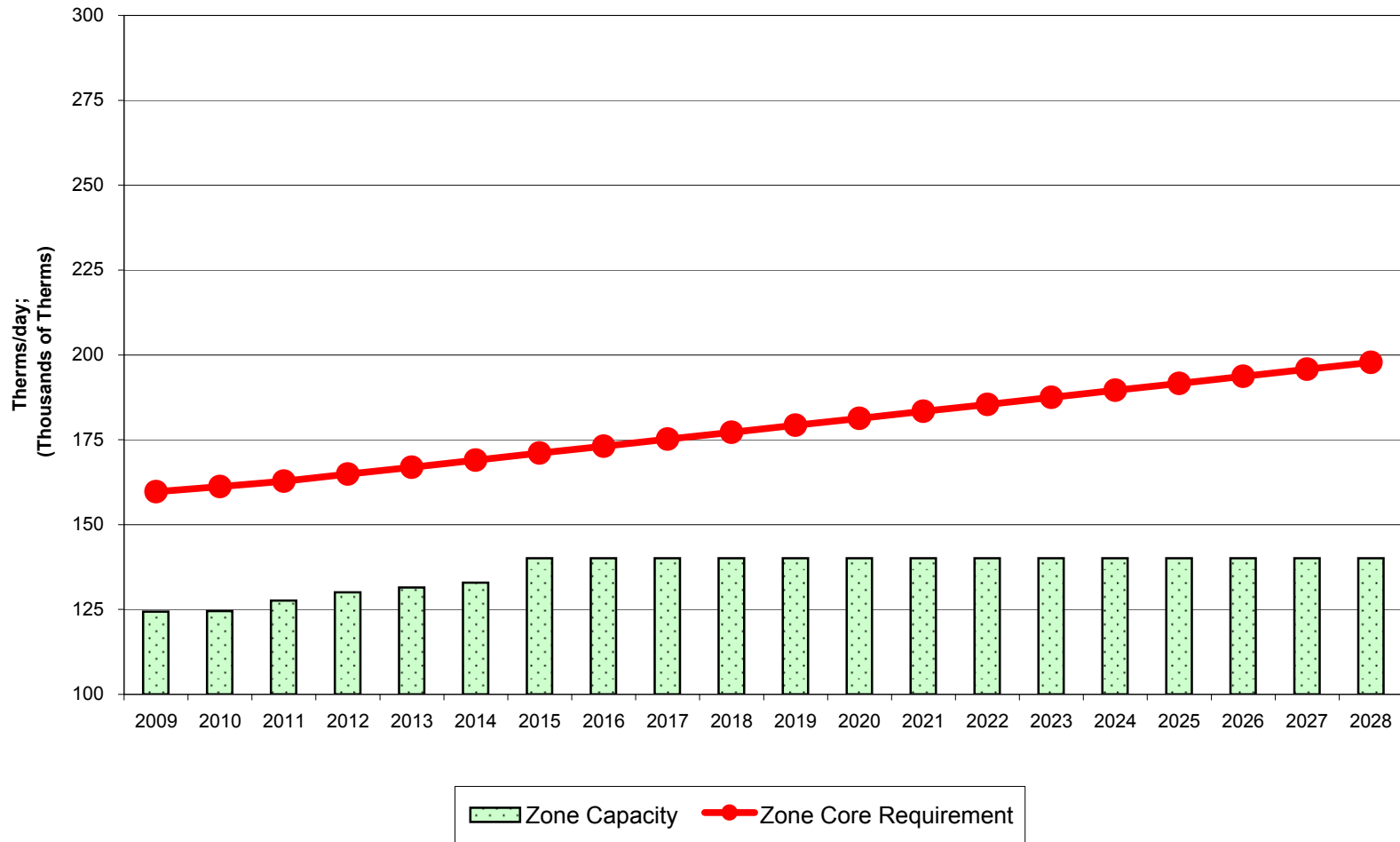
Note: Reflects on Contracted MDDO's to Central Oregon Citygates. Citygate peaking supplies and short-term capacity releases are available to meet peak day requirements through 2010.

**ZONE ME - Oregon Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**



Note: WGPW Capacity is net of Non-Core primary term capacity requirements

**ZONE ME - WA Peak Day Demand & Existing Capacity Resources
Medium Load Forecast**

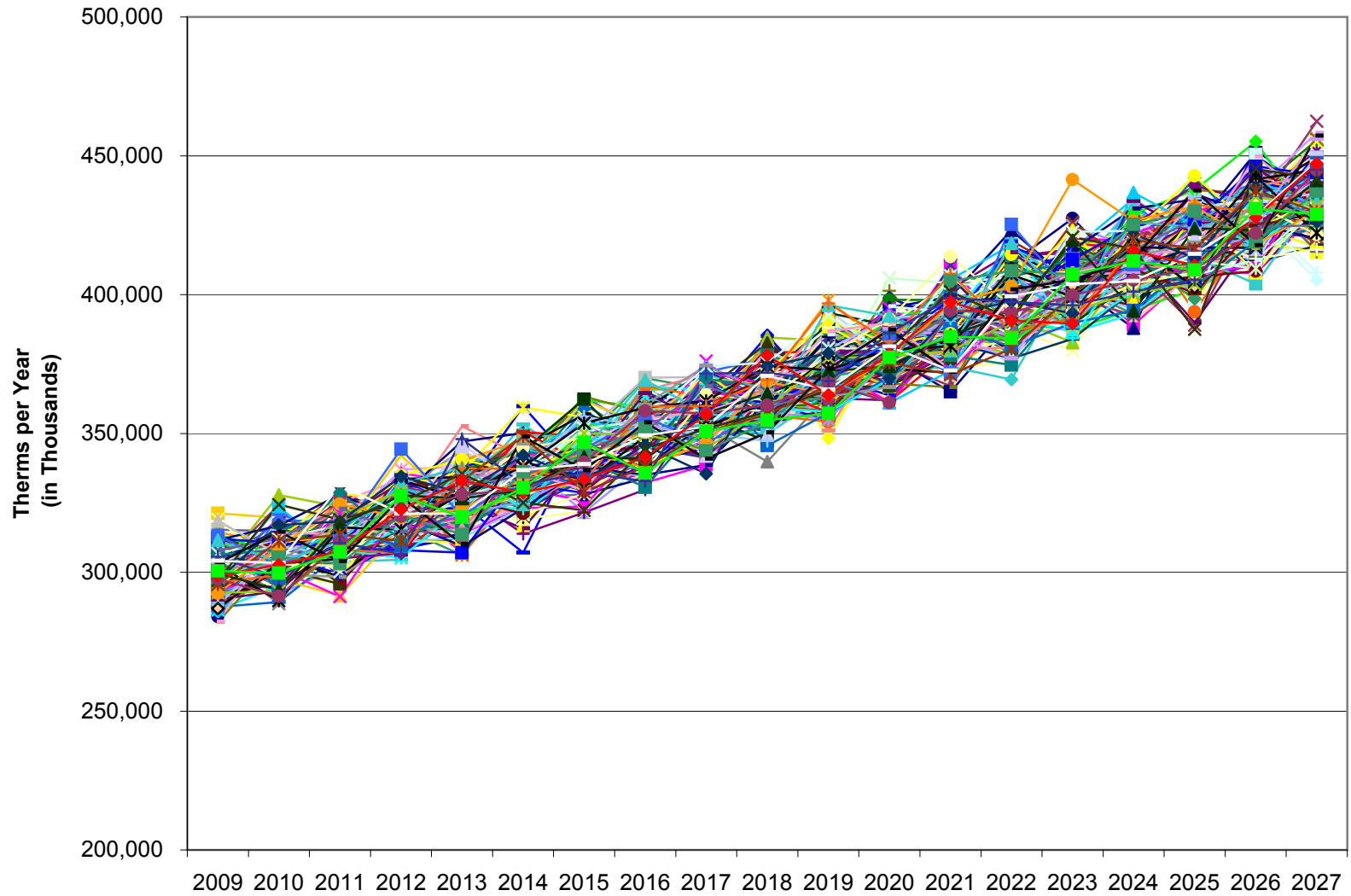


Note: WGPW Capacity is net of Non-Core primary term capacity requirements. Citygate peaking supplies and short-term capacity releases are available to meet peak day requirements through 2010.

Appendix G-1

**Weather Uncertainty Analysis
&
Impact on Annual Loads**

Monte-Carlo Simulation Results - Total System Demand Medium Growth Forecast



**Annual Load in Therms
(000's)**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
HighGrowth-Avg weather	300,721	312,416	324,890	338,225	351,452	365,226	379,346	394,088	408,520	423,645
Medium 95%-Max	314,117	320,161	328,635	336,352	343,201	351,092	359,202	365,840	373,166	381,856
Medium-Avg Weather	299,284	305,532	312,414	319,972	327,260	334,810	342,431	350,265	357,625	365,314
Medium expected high	306,887	312,696	320,902	328,526	335,094	342,664	350,516	357,441	364,973	373,438
Medium Load-Expected	299,658	305,230	313,170	320,700	326,988	334,236	341,829	349,043	356,780	365,020
Medium Expected Low	292,429	297,764	305,438	312,873	318,882	325,808	333,142	340,645	348,587	356,602
Medium 95%-Min	285,200	290,298	297,706	305,047	310,775	317,379	324,456	332,247	340,394	348,183
Low Growth-Average Weather	294,103	298,757	303,745	309,175	314,117	319,160	324,123	329,224	333,685	338,337

**Annual Load in Therms
(000's)**

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
HighGrowth-Avg weather	439,065	455,206	470,963	487,457	504,331	521,960	539,130	557,100	575,522	594,773
Medium 95%-Max	392,433	397,199	406,819	417,552	422,023	431,544	439,783	448,752	453,933	463,495
Medium-Avg Weather	372,985	380,955	388,344	395,999	403,672	411,685	419,062	426,760	434,510	442,672
Medium expected high	382,477	388,680	397,496	406,924	412,614	421,712	429,143	438,572	444,492	452,701
Medium Load-Expected	372,522	380,161	388,174	396,295	403,205	411,880	418,504	428,391	435,051	441,907
Medium Expected Low	362,566	371,641	378,851	385,666	393,796	402,048	407,865	418,211	425,610	431,113
Medium 95%-Min	352,611	363,122	369,528	375,038	384,387	392,216	397,226	408,030	416,169	420,319
Low Growth-Average Weather	342,846	347,540	351,568	355,784	359,908	364,198	367,807	371,609	375,355	379,278

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	295,522	298,367	314,610	317,272	324,264	327,722	339,848	349,078	355,544	359,824	381,671	375,372	386,117
2	295,528	294,360	312,724	328,283	331,212	336,163	343,056	344,677	349,356	380,511	371,836	378,633	410,427
3	299,383	299,859	295,937	331,590	335,811	316,945	343,737	351,920	354,288	363,363	370,378	362,263	383,544
4	304,131	302,550	319,702	319,549	324,934	337,224	345,190	357,304	352,183	368,562	364,210	377,510	403,401
5	305,836	311,760	317,198	328,952	318,187	336,656	348,318	360,869	364,041	361,747	363,043	384,214	385,542
6	296,184	308,406	303,341	327,828	317,302	331,088	343,993	346,538	362,558	381,101	367,704	393,703	378,088
7	302,802	307,489	323,224	317,530	324,756	338,099	338,004	353,335	361,800	372,997	360,562	382,198	387,491
8	298,759	310,197	318,777	315,644	317,663	327,867	343,738	355,989	344,343	374,867	370,470	363,700	383,114
9	295,357	295,803	315,971	317,015	330,804	324,217	351,674	338,156	371,371	365,052	387,350	392,245	387,129
10	309,026	296,206	311,238	329,059	322,985	341,077	332,439	347,933	358,731	350,688	379,814	382,305	394,509
11	304,656	301,144	314,133	323,785	329,106	333,204	344,438	345,986	355,680	356,811	383,885	374,082	384,575
12	295,887	318,636	323,929	322,026	323,698	319,277	340,376	349,091	357,816	372,326	352,456	378,583	373,628
13	310,735	292,606	312,272	327,184	341,131	329,339	347,819	358,142	347,625	371,983	363,186	379,578	400,285
14	293,602	308,938	310,058	337,013	338,275	334,564	350,727	346,271	344,975	375,734	375,938	387,811	399,204
15	291,873	301,459	307,402	316,571	331,978	345,739	333,061	349,297	368,105	356,240	373,865	387,418	392,363
16	299,613	309,314	314,887	319,517	329,999	330,408	344,243	348,523	354,040	368,638	362,961	388,448	368,944
17	297,326	300,718	328,030	319,388	325,486	334,745	345,964	349,526	372,108	377,079	367,475	380,142	381,080
18	312,353	301,747	303,706	304,493	328,105	353,207	338,647	355,954	349,215	356,889	383,235	386,433	371,509
19	311,339	301,659	324,407	326,668	331,268	342,611	335,278	349,534	358,049	364,418	355,911	386,107	383,663
20	321,221	319,620	316,695	327,730	340,260	345,617	342,316	355,205	355,402	359,947	355,274	385,651	396,981
21	292,310	301,489	316,956	323,107	319,330	344,219	335,976	351,377	356,297	355,836	357,932	380,924	385,483
22	312,524	308,631	321,043	316,115	329,361	328,623	340,948	348,872	343,459	379,286	358,794	371,932	390,108
23	315,296	314,753	309,407	322,813	330,468	326,761	328,088	351,079	356,929	364,854	366,895	386,757	406,290
24	307,568	314,970	320,576	317,779	321,636	340,064	348,081	351,255	354,839	368,453	353,973	387,817	386,278
25	292,687	306,499	319,384	307,337	320,401	339,596	347,130	354,573	359,125	360,163	369,891	369,930	385,697
26	310,594	301,557	304,879	325,842	335,114	343,779	347,355	369,873	365,944	368,832	361,861	372,801	388,414
27	290,059	303,844	310,764	319,169	331,423	328,961	336,639	344,706	359,373	355,290	377,854	372,210	393,032
28	294,280	299,802	305,337	323,337	327,495	322,256	334,052	345,251	355,525	370,794	360,154	368,407	392,658
29	305,919	316,290	315,788	332,738	329,456	331,613	337,258	344,674	348,179	360,533	375,313	373,800	399,793
30	293,707	307,044	307,060	325,698	322,016	331,070	333,111	346,785	341,503	360,446	366,791	375,967	367,086
31	293,455	316,941	314,669	320,050	325,259	343,354	337,998	345,204	341,177	366,262	382,092	380,078	378,907
32	295,838	303,904	309,677	308,202	331,224	319,785	354,349	353,251	368,320	368,884	378,836	385,854	382,711
33	293,481	320,393	312,052	307,857	314,237	331,379	348,986	357,677	352,619	364,870	375,092	381,003	391,334
34	306,368	306,964	315,704	316,549	320,401	338,833	334,488	334,320	364,588	374,676	370,103	361,511	379,522
35	307,485	302,256	322,090	322,939	317,575	332,313	337,471	352,338	361,847	368,846	386,269	385,681	386,824
36	304,744	303,582	307,572	323,254	328,473	359,830	335,048	365,841	356,492	357,583	373,820	371,932	382,773
37	304,967	296,532	308,554	323,916	322,993	320,988	352,317	346,363	350,002	382,505	348,317	386,767	379,181
38	301,146	295,747	319,015	325,966	306,892	336,603	344,009	332,216	338,645	366,047	356,320	390,073	392,293
39	300,773	305,931	308,730	315,934	324,961	321,945	357,268	342,299	355,582	380,513	372,498	381,780	390,421
40	290,504	311,310	329,017	319,087	340,051	335,244	329,406	349,842	349,680	356,676	375,959	390,596	381,865
41	300,744	303,482	308,840	315,502	329,366	340,724	344,359	350,525	352,556	382,704	370,091	379,019	396,026
42	284,081	308,688	304,654	322,069	324,255	335,358	355,994	335,735	351,752	374,563	383,609	371,253	393,936
43	299,973	310,975	316,279	324,054	325,207	335,313	337,983	361,475	360,838	364,628	366,353	401,350	377,664
44	299,426	319,444	313,883	333,329	318,837	329,352	338,091	358,340	347,336	362,518	362,725	361,963	388,354
45	293,908	315,002	321,948	310,967	326,251	324,857	333,284	339,717	353,666	372,923	372,794	368,741	386,078
46	300,158	296,133	317,889	316,231	327,583	324,453	353,851	338,549	348,011	371,759	359,274	383,008	388,434
47	299,428	309,867	319,858	309,614	330,027	323,791	333,249	355,149	358,353	362,558	382,871	382,863	381,834

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
48	303,299	292,048	302,051	320,224	329,285	339,839	321,650	339,436	361,832	359,877	382,794	367,367	379,501
49	302,600	324,188	297,586	327,619	324,572	327,948	335,082	340,617	365,627	357,487	379,085	382,682	388,807
50	294,537	312,007	300,080	314,308	332,406	320,958	333,523	349,211	366,003	371,479	376,504	392,311	376,231
51	296,290	301,428	304,016	308,421	325,514	331,222	336,362	335,231	363,918	362,143	383,639	371,580	400,170
52	304,649	310,607	306,757	322,152	331,304	337,181	346,457	349,670	353,236	361,958	384,523	380,539	387,739
53	290,491	305,513	313,323	320,691	352,584	341,714	335,634	365,493	371,360	358,933	377,284	374,598	394,661
54	287,524	289,248	306,443	308,395	333,524	329,578	338,677	337,174	355,140	368,888	387,185	379,489	388,870
55	299,104	302,515	302,743	307,198	330,930	332,664	362,460	350,899	354,816	362,992	394,278	377,978	389,961
56	305,877	298,209	317,138	319,241	322,449	333,436	346,319	340,063	344,523	371,819	374,760	377,667	365,005
57	304,363	297,651	314,206	335,677	332,266	330,172	325,653	346,337	368,549	358,276	368,190	374,045	391,045
58	294,564	306,751	297,692	328,087	321,793	328,524	344,656	347,512	360,910	376,143	382,695	382,594	394,621
59	286,431	295,129	317,490	319,348	324,228	330,842	338,199	368,146	346,649	369,285	378,738	373,710	392,442
60	307,941	304,506	319,322	316,922	325,474	329,081	340,240	351,011	355,676	358,891	377,329	381,120	385,553
61	309,738	302,669	318,827	320,728	326,838	331,372	343,888	347,202	362,856	375,867	364,419	375,658	381,336
62	296,494	313,968	308,821	306,655	338,652	344,331	332,885	348,785	354,855	363,573	360,935	389,811	391,613
63	304,896	297,321	317,179	320,872	324,491	330,108	350,385	350,976	361,230	360,946	354,724	396,111	394,147
64	285,824	303,457	319,760	313,780	341,926	337,478	335,755	359,584	372,318	368,469	381,136	391,296	388,532
65	298,601	306,917	325,445	322,736	335,320	332,933	336,533	345,001	358,620	364,822	366,263	366,829	391,813
66	305,179	305,440	308,289	312,061	322,401	336,930	329,404	335,010	353,054	369,884	375,240	372,017	407,995
67	300,573	310,371	312,696	319,998	320,139	319,307	321,900	366,479	352,309	364,278	389,482	373,678	393,910
68	306,704	297,347	305,860	317,475	333,616	330,359	344,633	354,347	357,173	379,891	371,847	371,985	377,716
69	302,617	303,258	322,010	326,735	318,662	323,596	351,114	342,504	349,107	380,615	374,279	383,678	382,289
70	306,263	311,428	323,519	318,944	330,510	344,907	345,579	348,650	350,347	363,221	377,746	393,202	391,196
71	292,987	308,611	310,784	322,727	327,421	328,070	337,172	354,357	366,177	356,281	360,369	379,802	392,684
72	286,211	320,911	313,722	321,025	332,234	336,424	363,315	349,950	355,371	354,712	376,381	375,902	393,695
73	295,798	309,781	310,459	319,459	326,341	337,631	352,414	347,958	367,491	360,386	379,143	372,289	374,039
74	304,440	308,594	323,555	320,458	332,103	326,272	333,289	365,623	366,597	362,180	375,992	390,133	384,337
75	292,119	297,672	291,570	315,201	325,606	337,531	361,870	352,790	355,319	368,517	366,035	386,129	390,838
76	314,559	309,645	304,020	326,265	317,339	329,515	334,969	349,587	351,111	370,334	375,799	388,515	373,391
77	298,693	303,827	309,791	333,896	306,176	332,527	345,946	352,758	348,081	355,298	384,306	370,450	377,947
78	302,974	310,275	311,936	323,599	332,106	339,206	332,267	348,886	347,197	372,071	362,323	373,399	380,889
79	294,552	310,231	323,907	329,189	343,927	329,976	348,526	336,277	358,992	369,048	384,578	387,755	380,771
80	301,687	306,303	310,926	308,441	312,744	338,925	353,996	344,476	365,962	371,106	389,204	372,831	391,924
81	303,334	311,519	309,115	315,983	306,229	336,738	353,289	338,647	358,544	364,711	368,584	377,995	391,454
82	294,386	302,527	303,384	315,777	328,580	346,563	334,972	340,082	363,840	371,773	365,136	395,252	396,567
83	302,328	301,360	295,760	327,065	328,702	324,214	336,974	350,621	353,221	372,083	360,166	380,082	381,253
84	295,856	294,470	315,976	323,915	326,729	341,342	331,455	339,489	352,195	363,579	365,874	372,262	378,347
85	302,930	296,224	305,261	309,494	328,082	340,330	337,876	345,434	352,739	365,169	369,659	368,201	380,177
86	302,407	302,820	311,485	310,253	332,483	322,631	333,146	365,059	354,729	350,726	377,337	375,733	410,628
87	304,236	295,131	308,976	318,604	314,016	335,990	341,187	359,047	372,382	364,163	374,213	377,742	387,987
88	297,406	298,397	325,557	317,180	325,120	346,745	356,412	356,535	361,392	374,903	383,410	384,178	388,951
89	305,899	298,681	320,228	307,620	323,146	350,517	348,864	352,164	347,548	379,254	379,387	372,149	382,245
90	298,621	294,796	322,048	317,098	323,081	343,172	362,062	359,449	353,429	352,079	378,093	379,176	407,258
91	301,637	313,341	316,677	307,945	314,254	331,616	328,578	338,814	359,732	385,303	360,917	398,855	390,651
92	299,928	297,904	308,393	311,333	310,857	343,106	332,776	353,221	357,990	360,949	360,163	382,016	395,658
93	296,928	300,351	311,801	315,687	338,843	326,111	338,050	337,293	348,505	356,481	374,542	361,134	386,605
94	309,262	294,831	317,964	325,261	328,649	321,068	339,361	363,313	356,831	372,128	373,245	376,264	394,342

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
95	306,184	310,694	325,466	321,659	326,894	329,797	340,222	353,966	356,160	381,331	368,566	382,609	387,448
96	311,299	311,451	320,484	328,322	321,752	327,289	346,692	347,421	353,310	358,963	361,166	398,171	398,064
97	294,067	306,486	311,893	319,230	330,878	327,885	334,910	353,192	346,773	367,721	360,828	390,209	397,369
98	282,065	306,171	308,309	326,619	331,000	339,257	363,352	357,292	352,841	357,026	372,763	367,912	366,619
99	293,072	301,464	308,890	318,553	325,784	340,858	345,381	350,732	363,203	373,611	382,766	366,970	381,824
100	298,246	314,266	316,755	313,403	334,055	335,440	360,454	347,162	362,081	363,409	386,546	387,650	373,312
101	302,802	310,706	311,106	313,516	327,054	332,613	349,679	370,128	370,316	361,065	363,618	366,835	395,788
102	300,784	306,954	309,665	325,384	326,625	339,187	340,074	354,462	352,695	339,823	363,915	379,342	387,609
103	306,662	307,201	316,218	315,033	327,552	333,750	338,251	358,619	350,367	353,237	382,866	377,775	393,424
104	304,983	307,170	305,919	325,232	333,905	347,009	331,326	343,159	365,775	353,037	377,364	375,046	381,850
105	293,419	305,251	318,802	312,689	328,990	337,361	334,854	339,385	348,362	370,366	381,301	378,128	400,181
106	288,747	318,849	319,560	330,378	327,527	331,023	354,420	342,764	357,329	360,696	366,958	384,651	396,248
107	302,522	305,235	322,807	325,185	324,515	315,787	341,563	352,972	351,012	353,462	358,519	379,676	406,323
108	290,548	307,248	324,844	308,964	331,397	324,012	335,548	352,888	357,981	381,693	351,029	386,699	371,319
109	295,064	304,911	313,410	331,586	325,827	332,743	358,735	342,435	367,501	369,542	363,763	384,984	379,013
110	306,050	313,370	315,633	316,998	342,706	338,288	354,777	354,397	349,485	379,387	369,763	370,519	390,235
111	304,846	315,278	311,063	327,631	347,128	350,138	328,019	333,982	365,160	372,320	376,988	395,300	399,197
112	294,185	314,276	309,627	323,878	314,065	323,130	323,706	348,110	376,153	357,031	371,208	375,656	383,719
113	294,008	308,898	322,130	331,255	336,168	359,433	355,825	337,463	354,339	357,787	376,617	376,926	379,117
114	295,523	305,443	310,378	328,868	331,505	343,534	342,245	367,013	365,520	368,884	366,457	381,222	376,832
115	301,811	303,007	315,885	318,908	328,912	313,864	321,579	329,802	363,134	377,096	363,693	367,724	378,709
116	311,069	309,442	296,212	319,475	320,810	336,866	332,228	353,498	349,504	363,184	363,379	372,169	387,798
117	296,136	305,973	322,774	317,992	315,420	329,120	338,394	358,250	347,661	352,504	380,607	365,150	401,295
118	291,276	306,251	299,304	311,120	337,935	343,246	333,484	355,238	352,798	362,045	366,916	394,277	381,350
119	298,207	323,575	305,542	329,517	331,175	334,269	329,517	342,167	354,286	352,577	370,564	382,821	405,435
120	296,958	311,349	311,524	330,080	329,554	338,543	350,375	355,715	373,830	362,515	365,902	384,939	384,255
121	298,501	296,844	300,237	329,587	328,388	335,878	337,558	352,325	360,353	356,749	367,921	405,909	404,086
122	319,039	300,790	304,710	318,828	334,545	320,701	328,316	342,792	345,460	367,589	377,809	391,593	378,883
123	304,618	313,450	309,342	311,016	312,344	323,317	349,790	342,389	358,399	371,042	372,598	380,180	391,678
124	287,675	310,195	325,040	333,629	325,290	326,029	344,813	352,112	360,454	365,133	379,436	391,773	391,332
125	297,315	301,684	315,876	336,792	314,264	324,240	343,903	349,331	350,065	360,868	385,467	370,294	389,137
126	288,521	305,552	298,440	317,201	333,270	345,070	356,867	351,250	356,432	363,006	363,193	380,669	393,416
127	301,133	318,926	317,790	313,511	325,562	334,542	354,989	345,893	373,596	361,244	380,900	391,014	396,764
128	291,341	305,369	313,120	320,204	334,229	349,330	348,731	337,312	352,753	349,627	365,081	373,981	396,455
129	300,345	327,789	323,616	315,863	326,776	335,589	354,098	345,803	351,982	384,555	383,425	389,152	384,717
130	304,171	296,792	312,470	342,090	322,251	326,914	343,592	354,927	369,983	367,246	376,150	366,773	395,457
131	299,948	295,100	307,006	322,191	340,250	347,725	335,546	356,228	347,378	368,875	397,958	380,129	384,260
132	289,299	299,192	314,059	319,196	335,427	330,660	338,770	367,073	363,165	356,561	354,269	383,973	388,875
133	288,142	299,697	323,734	307,083	333,514	333,104	340,431	336,872	350,772	356,306	366,716	389,321	398,530
134	306,912	299,212	298,323	313,573	317,434	328,741	353,471	346,322	352,390	365,671	383,039	375,732	394,529
135	306,465	301,875	320,112	313,748	330,219	337,883	339,322	353,849	364,791	358,013	380,443	385,056	382,843
136	292,492	297,463	320,796	313,582	327,171	323,606	346,264	342,281	348,236	363,189	362,188	379,206	397,374
137	298,129	305,188	308,577	314,787	336,019	343,788	362,369	339,769	355,873	347,182	393,449	388,916	390,068
138	293,382	300,784	308,971	320,316	327,083	330,060	334,056	341,168	365,600	382,571	366,231	367,260	377,017
139	296,302	305,818	306,174	312,763	334,188	335,320	339,129	359,524	357,374	360,130	357,917	384,105	384,304
140	295,287	315,201	305,857	330,709	327,038	335,367	342,106	350,907	365,490	372,444	374,104	376,884	389,749
141	297,761	304,657	317,240	323,471	339,748	325,288	340,715	357,416	351,096	355,056	382,228	389,265	391,084

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
142	290,986	296,580	306,582	333,635	334,345	327,030	344,054	344,723	357,154	360,028	384,832	373,267	371,856
143	304,669	293,988	307,181	316,029	323,293	348,752	337,264	345,042	352,401	373,082	363,155	383,954	384,070
144	301,552	301,385	319,271	313,527	324,598	350,509	339,445	357,153	359,554	366,697	357,559	375,836	384,963
145	313,772	306,088	307,656	320,157	322,704	327,389	352,773	351,479	356,192	371,771	368,856	392,777	394,286
146	305,135	312,519	308,718	307,934	307,117	336,172	335,329	349,595	358,840	362,019	376,952	377,743	389,392
147	294,441	312,311	327,845	327,790	313,364	342,098	341,493	350,063	371,696	355,401	388,506	376,695	397,375
148	293,157	300,995	291,216	323,404	314,438	338,126	353,943	341,279	372,108	367,711	376,785	395,115	382,844
149	290,004	304,329	307,951	305,171	323,558	322,904	341,667	341,175	367,495	361,462	377,169	383,001	381,005
150	293,016	312,758	308,341	334,737	326,564	321,131	343,961	347,719	353,218	370,551	374,480	387,240	386,240
151	301,401	315,895	309,063	318,561	336,772	343,703	339,672	349,585	356,623	367,473	372,964	376,145	381,883
152	311,571	316,838	328,014	318,525	309,395	323,048	337,647	335,061	338,656	361,908	384,828	372,782	382,915
153	297,325	291,438	308,356	324,737	327,497	340,889	340,833	347,931	360,548	367,084	362,566	383,934	391,525
154	293,471	307,273	305,063	306,870	332,252	342,743	328,937	346,921	341,975	363,638	380,693	377,695	391,134
155	302,779	300,830	318,861	314,450	318,396	337,171	340,774	330,595	355,579	378,154	371,724	385,688	378,057
156	318,511	306,427	315,770	313,779	315,531	334,234	338,004	359,725	356,702	364,334	370,734	380,611	391,032
157	305,343	288,738	318,499	323,105	321,599	327,777	342,880	354,445	368,405	355,709	367,560	391,626	383,896
158	290,987	301,348	321,457	314,027	320,989	325,389	336,174	338,486	349,219	357,870	354,926	377,330	391,800
159	306,125	297,201	327,183	316,096	312,179	341,286	333,252	344,257	359,934	367,968	362,156	378,386	384,116
160	304,902	293,521	324,841	322,614	322,464	327,507	335,739	355,203	353,128	369,830	388,326	389,157	404,318
161	304,061	299,028	311,966	319,140	323,068	337,989	345,473	339,556	357,358	366,970	385,630	395,723	393,563
162	290,198	293,349	312,400	318,642	333,294	334,428	337,893	364,506	354,053	354,404	378,052	382,847	386,015
163	299,000	309,469	322,973	328,477	314,698	345,119	341,950	350,637	354,880	365,799	392,479	373,545	380,243
164	307,277	295,308	314,775	309,603	326,898	330,653	334,131	340,596	371,134	345,664	357,349	370,521	387,692
165	303,521	310,100	314,399	317,608	346,284	329,541	344,902	358,167	341,853	349,442	373,210	375,355	385,758
166	292,626	308,827	316,619	329,771	321,227	339,832	345,242	338,092	353,618	371,941	365,199	380,183	396,965
167	304,318	301,928	321,328	315,605	319,968	342,350	341,218	353,002	363,623	364,999	372,312	381,441	372,620
168	296,591	310,812	313,251	334,951	340,499	335,825	345,795	338,567	346,456	372,592	390,848	382,343	385,987
169	297,663	305,709	305,738	315,861	336,895	322,912	348,573	345,103	367,793	359,403	357,862	369,345	391,334
170	296,023	294,615	318,963	332,362	326,059	339,883	333,258	342,677	368,378	355,959	377,945	380,719	401,922
171	287,577	301,041	311,863	318,395	328,204	331,741	341,361	345,885	359,884	370,470	370,530	384,076	378,997
172	306,436	308,016	328,693	311,611	322,414	343,175	342,064	340,958	369,581	366,777	380,147	370,534	382,997
173	312,100	310,529	309,051	333,193	324,716	337,431	341,974	337,372	359,623	361,882	369,326	382,522	398,090
174	296,851	304,573	315,097	330,318	324,801	342,948	353,885	351,149	353,204	364,872	369,068	360,967	372,636
175	295,735	307,608	303,667	319,839	324,941	336,822	353,165	345,720	374,163	375,518	392,522	378,224	406,783
176	306,772	311,879	316,973	315,203	327,875	332,830	351,865	354,581	358,909	358,074	380,715	380,453	395,766
177	297,004	302,845	302,319	326,062	329,147	344,699	348,422	336,540	363,940	362,054	378,472	391,182	413,691
178	288,112	309,353	306,132	334,115	323,833	337,889	356,083	352,498	349,912	347,285	380,338	391,606	393,116
179	282,230	314,234	313,783	325,084	335,526	336,495	329,781	355,330	357,777	365,365	386,744	389,857	372,956
180	303,660	304,059	310,653	323,989	333,253	337,486	340,093	353,839	347,125	370,321	373,986	387,714	385,387
181	286,951	303,219	304,700	333,205	326,412	340,138	332,491	348,901	352,429	361,135	377,202	378,458	383,365
182	313,319	302,323	313,215	344,382	320,243	334,915	344,574	355,827	346,459	359,100	370,751	382,948	371,646
183	311,570	303,785	311,029	332,017	337,666	324,471	344,044	369,186	357,008	354,913	396,201	392,284	379,810
184	292,643	293,166	319,357	329,254	319,733	329,024	350,007	349,547	344,604	358,923	377,307	377,637	379,785
185	302,583	289,822	316,128	315,389	328,482	338,063	353,725	359,322	361,778	374,197	372,884	380,109	381,484
186	292,473	308,837	324,595	319,643	322,802	333,798	343,157	337,770	346,650	368,555	364,254	376,817	396,645
187	296,129	299,071	308,131	306,919	337,395	337,263	332,682	359,747	359,862	369,219	396,827	383,114	407,455
188	307,928	312,051	322,820	314,639	331,329	334,550	344,312	351,072	367,049	359,154	365,835	379,266	393,077

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
189	300,938	303,418	319,075	324,931	330,415	346,356	338,298	360,352	374,388	364,644	363,241	366,634	393,503
190	297,259	317,000	318,334	334,553	328,549	342,121	333,204	345,697	335,465	374,209	378,825	369,837	392,800
191	297,182	305,447	303,057	320,530	313,557	336,194	341,992	351,776	343,719	354,152	370,538	374,071	404,851
192	299,605	293,620	317,026	327,735	326,522	329,839	341,474	340,768	357,319	364,381	372,445	374,157	385,468
193	297,025	324,348	318,969	325,134	335,500	325,026	322,361	344,513	351,727	357,821	365,692	380,530	401,130
194	295,644	311,066	313,597	311,420	333,014	349,044	329,031	338,013	350,539	356,930	367,355	375,558	371,220
195	297,652	291,357	310,458	320,122	327,924	329,915	339,666	358,071	357,192	360,155	368,252	361,026	394,161
196	305,611	297,994	310,640	306,651	347,973	331,612	335,791	332,872	371,629	371,904	368,906	386,140	398,854
197	303,196	314,541	304,035	327,188	310,166	348,906	336,801	353,972	340,882	350,321	373,296	387,434	372,177
198	304,095	303,303	331,233	321,141	321,123	336,822	338,906	349,277	352,498	370,667	365,791	381,284	372,634
199	298,860	302,636	307,612	322,597	332,911	328,726	333,496	341,482	356,701	378,159	363,799	378,457	397,307
200	300,498	299,683	307,390	327,573	319,906	330,356	346,827	335,722	350,883	354,811	357,215	377,355	384,859
Max	321,221	327,789	331,233	344,382	352,584	359,830	363,352	370,128	376,153	385,303	397,958	405,909	413,691
Min	282,065	288,738	291,216	304,493	306,176	307,108	321,579	329,802	335,465	339,823	348,317	360,967	365,005
Average	299,658	305,230	313,170	320,700	326,988	334,236	341,829	349,043	356,780	365,020	372,522	380,161	388,174

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2022	2023	2024	2025	2026	2027	2028	20 Yr Total
1	390,543	409,515	424,139	405,001	438,288	438,865	432,169	7,363,730
2	384,192	407,230	389,078	408,940	407,636	429,207	444,781	7,347,830
3	391,704	400,639	416,788	422,602	419,839	439,204	442,307	7,342,100
4	397,301	407,777	403,400	424,195	445,828	434,522	455,424	7,444,896
5	399,246	395,130	409,682	420,197	435,121	451,695	429,227	7,426,660
6	390,187	400,045	399,146	412,238	442,797	444,648	449,256	7,396,151
7	400,335	409,573	416,589	442,119	420,676	423,343	445,274	7,428,195
8	402,140	393,277	409,915	408,855	452,285	433,492	432,276	7,357,367
9	389,599	416,238	434,510	420,024	427,874	442,615	444,638	7,447,642
10	387,776	390,814	406,765	429,937	427,372	405,276	446,426	7,350,376
11	406,477	416,434	404,132	408,864	425,872	448,381	453,467	7,415,113
12	375,656	411,127	412,134	419,165	425,609	440,252	431,169	7,342,839
13	396,722	398,164	396,389	430,933	430,287	446,498	440,065	7,420,941
14	390,046	407,957	425,523	429,822	431,246	433,551	427,854	7,449,108
15	384,646	404,877	395,561	416,122	429,218	439,395	441,684	7,366,877
16	405,953	404,321	390,437	408,241	417,354	424,432	444,323	7,334,595
17	389,011	391,262	433,054	414,134	433,419	432,547	425,461	7,397,954
18	408,887	388,199	410,839	431,030	436,193	435,272	451,434	7,407,348
19	382,422	417,271	422,843	400,733	437,106	415,934	441,443	7,388,663
20	394,463	403,891	410,226	429,557	433,110	435,563	447,480	7,476,209
21	410,871	393,944	429,939	417,638	416,559	428,082	428,390	7,346,659
22	415,265	399,906	424,113	421,476	427,780	456,217	440,165	7,434,617
23	387,472	401,199	413,777	410,896	430,825	427,437	429,644	7,381,641
24	382,260	412,355	414,945	431,878	436,199	439,165	456,084	7,446,176
25	390,740	397,777	412,682	409,357	433,671	437,841	448,873	7,363,355
26	389,744	403,442	392,919	413,259	437,462	437,626	444,182	7,415,480
27	392,146	415,423	412,701	409,206	437,582	429,959	435,017	7,355,360
28	391,014	406,037	417,550	417,536	432,452	436,436	441,403	7,341,778
29	390,515	407,335	397,838	411,680	432,005	418,380	440,835	7,369,939
30	398,581	399,288	406,899	432,028	433,841	438,876	434,474	7,322,271
31	388,344	410,417	422,423	405,377	412,289	432,036	459,691	7,376,024
32	416,096	403,256	407,475	427,500	440,005	426,005	446,296	7,427,470
33	396,961	396,665	424,693	411,259	412,571	435,089	441,671	7,369,888
34	399,207	403,759	423,098	420,318	436,935	432,381	419,975	7,359,701
35	389,345	387,470	394,628	401,725	414,022	429,151	431,969	7,332,247
36	385,702	409,144	422,189	415,489	422,236	451,162	430,894	7,407,759
37	397,613	417,066	412,682	413,964	424,152	417,288	436,448	7,342,615
38	394,213	392,146	416,610	409,649	442,388	432,398	434,156	7,326,535
39	396,454	409,013	404,582	421,203	434,710	437,711	443,310	7,405,618
40	390,151	406,333	413,424	428,645	428,193	425,715	434,161	7,385,859
41	402,085	410,320	414,347	410,816	437,559	455,542	435,586	7,440,192
42	411,338	427,470	405,136	412,414	427,473	440,161	453,427	7,423,367
43	405,330	401,990	415,827	437,580	436,714	428,106	431,490	7,439,127
44	414,354	414,892	404,019	428,207	407,990	430,605	464,392	7,398,058
45	399,345	395,897	404,965	426,238	435,675	439,306	444,300	7,365,862
46	402,613	401,741	411,221	426,884	417,741	416,332	435,277	7,337,142
47	397,952	405,381	424,660	419,230	445,041	438,134	469,752	7,458,387

Cascade Natural Gas Corporation 2004 Integrated Resource Plan-Update

approach used in the study prepared for the Energy Trust. At a levelized cost of \$1.70, Stellar estimated a technical potential of 16 million therms savings available by 2017. However, when measures are screened at a levelized cost of \$.95, which reflects the upper band of the current avoided cost estimates, the available therm savings are estimated at just over 12 million therms.

Additionally, Stellar's study provided both the "technical" and the "achievable" therm savings for each of the categories. The "technical" potential is the estimate of all energy savings that could be accomplished without the influence of any market barriers such as cost and customer awareness. Therefore, it provides a snapshot of everything that could be done. Technical potential does not represent what can be saved through programs since it would be impossible to get every customer to install every possible measure. For purposes of the studies, Stellar assumed that 85% of the eligible participants would pursue the energy efficiency measures by 2017. This assumption was based upon the achievable guidelines used by the NPPC for estimating achievable electric measures. After discussions with the Company's Conservation Advisory Group, which reviewed the results of the Washington Study, the company believes that 85% is too high since gas efficiency measures are not as widely accepted, primarily due to the incremental costs that must be born by the customer to install those measures compared to the amount of incentive the utility could provide and therefore 50% to 75% may be a more realistic range.

Although the company disagrees with the assumption that 85% of the technical potential is achievable, the Company does believe that the study provided valuable information regarding the available measures, their costs and their incremental savings extremely useful. One of the interesting findings was that many of the measures identified, particularly in the commercial/industrial market sector were part of the Company's commercial/industrial program that was implemented in 2005.

Through the Energy Trust, Cascade is pursuing the acquisition of the cost-effective measures identified in the study. The only measure identified in the study, where there is not a specific program is in the area of refrigeration heat reclaim which was shown as a cost-effective measure in the Commercial sector. According to the Oregon study, refrigeration heat reclaim in new and existing facilities, represents approximately 20% of the technical potential. At this time, none of the Northwest Gas utilities are offering an incentive program for these measures, however, through the custom program available through the ETO, Cascade's customers could receive incentives for pursuing such measures.

Conclusion

As the company has demonstrated, the company's resource planning continues to focus on ensuring that the Company can meet the needs of its customers in a way that minimizes costs over the long term. As shown above, the current long-term gas price forecasts are higher than those used during the development of the 2004 Plan and therefore, the company has increased its focus on the acquisition of cost-effective conservation.

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2022	2023	2024	2025	2026	2027	2028	20 Yr Total
48	405,034	387,846	412,018	429,921	424,582	434,653	436,888	7,330,145
49	408,346	405,485	407,095	403,972	427,034	437,874	443,121	7,386,827
50	397,495	407,253	407,741	427,383	438,425	437,457	441,258	7,396,569
51	404,379	409,683	414,110	413,266	430,450	444,545	441,310	7,377,678
52	383,405	402,478	423,497	404,640	422,288	436,838	441,983	7,391,900
53	405,122	408,972	413,571	423,054	425,093	433,016	446,594	7,457,703
54	403,745	388,449	433,756	404,359	440,199	428,240	443,003	7,351,888
55	386,797	418,614	416,858	421,504	421,582	425,587	441,927	7,401,405
56	390,339	397,902	400,465	424,145	451,111	430,359	433,075	7,343,903
57	408,636	396,322	425,369	417,498	414,176	443,486	433,752	7,385,668
58	411,173	406,718	419,004	396,750	432,468	455,095	449,450	7,437,200
59	401,861	404,270	415,432	422,843	423,976	428,116	435,710	7,372,847
60	413,636	416,307	412,241	404,223	432,930	438,568	445,290	7,416,261
61	388,610	400,909	395,979	425,214	424,099	420,205	448,962	7,365,378
62	386,957	417,383	407,182	432,136	433,214	435,811	460,396	7,424,458
63	407,526	405,624	415,427	427,629	415,008	430,138	437,006	7,378,744
64	389,490	400,964	406,128	421,351	416,941	430,507	429,143	7,393,839
65	408,815	396,002	417,312	396,331	450,396	438,543	446,075	7,405,306
66	402,103	400,783	416,841	429,835	436,834	435,010	431,723	7,386,036
67	388,103	379,884	412,284	424,746	407,343	442,313	439,344	7,339,141
68	411,609	413,446	426,461	402,976	414,739	431,679	427,310	7,377,173
69	402,527	410,139	402,884	422,628	407,422	442,187	440,584	7,388,835
70	393,972	406,830	432,694	427,889	423,054	425,540	440,740	7,456,230
71	407,361	408,072	396,586	415,372	437,566	419,505	444,203	7,366,109
72	413,491	402,723	404,216	431,456	440,377	437,355	435,880	7,445,350
73	369,401	408,494	430,945	418,908	430,019	422,882	437,092	7,370,933
74	378,455	405,532	406,795	420,486	416,851	425,252	441,825	7,388,770
75	401,786	410,660	411,470	423,943	431,104	422,238	448,947	7,391,342
76	387,246	412,132	411,635	414,770	419,711	435,129	447,135	7,372,807
77	395,558	400,962	417,301	420,879	438,999	448,867	440,131	7,382,390
78	389,402	410,424	411,679	422,732	417,944	443,859	451,078	7,384,248
79	388,847	398,752	399,277	411,010	413,229	440,239	452,064	7,401,146
80	397,846	398,858	410,639	404,086	411,544	417,734	438,554	7,347,786
81	378,576	405,724	402,513	429,684	438,030	443,773	471,087	7,405,528
82	386,100	407,816	396,493	412,648	437,122	424,039	439,088	7,362,144
83	411,428	400,631	414,663	417,237	439,491	438,472	440,051	7,375,802
84	419,483	406,746	411,531	408,578	441,107	427,864	430,080	7,346,877
85	392,636	395,737	410,580	388,981	430,431	462,449	441,313	7,323,703
86	377,165	399,798	416,802	404,491	445,089	440,561	436,426	7,369,768
87	401,254	406,214	427,777	425,489	435,358	449,612	440,181	7,439,560
88	382,036	387,799	416,747	418,654	424,047	431,750	453,847	7,431,067
89	385,563	395,120	419,546	429,723	436,461	442,687	447,796	7,424,598
90	385,818	399,614	412,201	420,556	434,041	428,792	426,347	7,397,733
91	399,382	393,596	410,038	419,897	410,754	445,360	427,273	7,354,621
92	386,113	415,584	424,586	434,983	419,031	415,124	440,238	7,349,951
93	384,882	420,274	419,284	423,827	439,147	432,100	454,547	7,366,394
94	397,204	400,130	403,159	406,490	428,217	436,030	434,939	7,378,627

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2022	2023	2024	2025	2026	2027	2028	20 Yr Total
95	415,031	410,365	408,222	423,161	424,860	440,150	435,258	7,448,040
96	392,271	412,254	407,616	411,455	418,618	436,968	445,500	7,409,065
97	386,512	405,247	398,276	426,643	429,315	424,046	438,908	7,350,386
98	405,836	391,239	426,535	423,504	434,968	424,778	433,531	7,371,616
99	398,556	393,201	414,267	412,280	417,740	430,497	441,465	7,361,114
100	396,919	389,901	406,959	409,368	438,316	444,067	457,627	7,435,936
101	390,411	402,521	409,069	427,759	425,515	449,304	447,387	7,427,192
102	397,808	403,217	420,172	414,644	421,533	445,661	420,066	7,349,620
103	385,443	424,887	416,586	400,305	420,989	432,668	433,397	7,375,229
104	386,884	393,185	422,282	421,115	430,751	437,088	447,574	7,390,654
105	393,799	405,795	416,144	432,420	432,516	430,656	430,537	7,390,956
106	394,279	402,337	410,109	415,859	429,597	407,963	443,918	7,383,211
107	384,436	405,147	414,474	389,973	420,881	431,788	431,527	7,317,804
108	402,116	393,398	423,365	435,632	421,185	437,990	444,978	7,382,833
109	396,734	409,024	407,348	425,274	418,170	424,147	468,424	7,418,634
110	374,572	411,473	396,290	426,136	411,216	449,449	450,037	7,420,779
111	423,186	404,061	387,914	436,429	428,085	425,974	457,502	7,490,203
112	399,395	400,967	413,041	407,191	410,548	442,795	442,073	7,330,756
113	390,384	415,484	420,463	418,209	435,466	426,489	428,603	7,425,065
114	392,029	386,529	392,997	410,116	418,452	434,433	442,556	7,360,537
115	394,667	395,267	410,195	437,177	421,220	435,313	443,037	7,321,002
116	394,196	399,900	402,615	424,824	421,388	432,844	445,274	7,336,676
117	412,283	396,834	404,078	425,955	431,225	431,398	450,197	7,383,244
118	405,363	416,135	407,256	431,248	424,134	433,854	456,771	7,410,002
119	417,993	402,875	400,207	417,406	420,902	436,857	454,466	7,426,510
120	377,302	406,144	413,612	420,469	430,739	444,430	444,482	7,432,718
121	402,411	397,090	418,055	424,868	427,123	435,837	451,967	7,431,687
122	383,782	394,385	401,924	422,338	427,699	435,451	453,728	7,350,362
123	406,558	400,421	395,108	435,791	423,912	433,703	434,644	7,370,301
124	392,828	404,196	404,804	420,929	445,296	425,314	438,931	7,425,211
125	385,365	388,177	427,089	411,924	437,979	458,202	421,047	7,369,019
126	379,415	406,296	396,784	417,929	441,517	437,376	445,263	7,377,468
127	399,511	414,679	410,190	431,521	431,458	431,463	454,426	7,489,112
128	396,779	397,262	408,476	413,549	403,827	434,534	428,911	7,320,870
129	391,847	382,709	412,210	415,963	430,565	438,288	431,319	7,426,612
130	404,246	388,345	414,977	424,690	440,255	438,981	476,291	7,466,601
131	396,153	409,571	399,553	430,628	423,670	427,756	458,173	7,428,098
132	398,177	411,022	425,618	393,786	426,660	447,180	403,472	7,346,434
133	387,453	396,529	410,295	421,801	438,414	415,468	443,835	7,338,018
134	385,299	410,262	420,996	410,389	422,299	428,001	440,032	7,352,629
135	376,950	384,084	401,509	404,666	440,652	425,868	454,016	7,362,366
136	404,427	399,149	412,904	398,507	430,452	422,084	431,335	7,312,706
137	407,401	389,634	403,964	415,916	414,497	443,712	451,224	7,410,463
138	406,340	401,252	404,183	419,753	420,294	442,047	438,549	7,346,916
139	395,995	426,055	410,310	423,245	422,744	446,937	439,950	7,398,284
140	402,859	399,046	392,555	408,070	436,465	420,609	418,280	7,359,027
141	387,472	400,446	407,751	415,406	435,875	441,013	441,984	7,403,975

**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2022	2023	2024	2025	2026	2027	2028	20 Yr Total
142	402,807	405,873	407,609	426,921	431,144	447,233	431,329	7,377,988
143	409,181	392,133	410,028	421,625	414,596	444,976	445,789	7,371,205
144	391,726	418,501	416,451	407,085	424,387	432,905	437,801	7,380,905
145	382,669	397,914	429,119	437,647	455,115	423,101	441,568	7,453,035
146	417,419	408,418	404,414	406,123	440,571	436,099	433,574	7,374,082
147	400,542	423,242	397,432	429,560	407,914	433,832	462,818	7,454,418
148	396,951	405,844	421,411	431,893	424,713	442,806	424,022	7,398,760
149	400,252	386,783	401,061	410,867	435,393	441,857	423,288	7,306,392
150	394,792	396,673	403,563	406,409	408,482	441,541	444,228	7,355,646
151	391,050	418,831	406,086	414,634	425,766	429,928	442,319	7,398,352
152	391,757	416,080	430,995	434,291	425,373	420,139	435,446	7,375,268
153	395,924	389,725	411,033	418,480	422,106	432,763	438,774	7,353,468
154	402,414	406,340	425,216	439,203	433,019	430,222	442,244	7,397,324
155	374,653	400,849	417,837	428,684	420,688	436,039	474,346	7,386,153
156	397,842	399,414	402,409	409,639	416,181	436,383	428,278	7,355,540
157	383,412	399,742	415,511	415,192	439,526	441,812	447,204	7,391,981
158	407,822	390,935	406,876	416,052	420,806	444,716	453,964	7,321,173
159	390,199	407,466	403,511	417,668	426,515	443,475	438,536	7,357,508
160	406,223	408,435	408,508	420,609	412,990	416,177	446,053	7,410,544
161	409,522	397,083	406,438	407,056	412,445	431,898	444,163	7,388,131
162	387,677	395,700	433,679	421,833	445,510	432,193	452,857	7,409,532
163	381,060	397,046	409,834	410,260	438,930	443,347	445,763	7,405,508
164	381,298	389,814	394,318	412,048	430,956	447,525	457,316	7,304,875
165	393,089	408,543	410,517	420,649	432,798	436,562	451,283	7,403,582
166	398,851	405,102	410,041	416,941	416,825	442,712	441,010	7,391,623
167	393,292	403,528	406,500	424,278	428,746	435,319	446,687	7,393,063
168	414,412	396,729	422,227	442,752	423,267	434,496	433,378	7,461,777
169	418,081	384,299	415,247	428,438	417,598	433,834	426,717	7,348,406
170	415,280	400,513	413,994	426,156	424,882	441,330	445,562	7,436,480
171	398,116	407,523	409,258	400,508	424,789	429,316	439,152	7,338,684
172	406,189	412,860	412,028	403,137	419,049	434,139	435,846	7,396,653
173	398,308	412,585	424,978	425,652	446,226	443,182	426,452	7,455,193
174	406,833	390,377	436,751	424,776	441,000	432,054	434,686	7,406,844
175	388,581	422,662	422,976	431,137	434,474	430,834	447,511	7,492,880
176	385,692	407,387	411,508	412,124	409,476	431,392	451,600	7,401,074
177	396,016	393,466	403,904	407,980	432,357	421,678	427,474	7,379,252
178	389,410	398,413	407,871	434,621	426,955	441,213	430,287	7,399,043
179	397,802	407,626	414,373	416,249	449,785	432,860	448,876	7,432,735
180	376,958	406,872	408,189	423,664	427,166	456,004	464,375	7,434,796
181	409,582	402,729	418,851	402,593	441,606	444,830	447,032	7,395,827
182	425,281	399,412	410,702	413,670	437,385	428,257	463,451	7,437,859
183	418,587	395,229	426,127	424,264	428,718	433,431	441,245	7,481,585
184	390,135	394,316	400,515	403,793	435,201	432,054	441,347	7,318,349
185	407,220	399,207	417,086	416,478	442,477	422,243	435,541	7,414,218
186	402,997	441,394	426,597	431,862	418,327	429,997	449,236	7,436,405
187	386,839	391,494	416,741	432,452	429,429	439,043	457,532	7,447,347
188	387,852	400,141	416,128	427,340	424,412	424,940	445,672	7,409,565

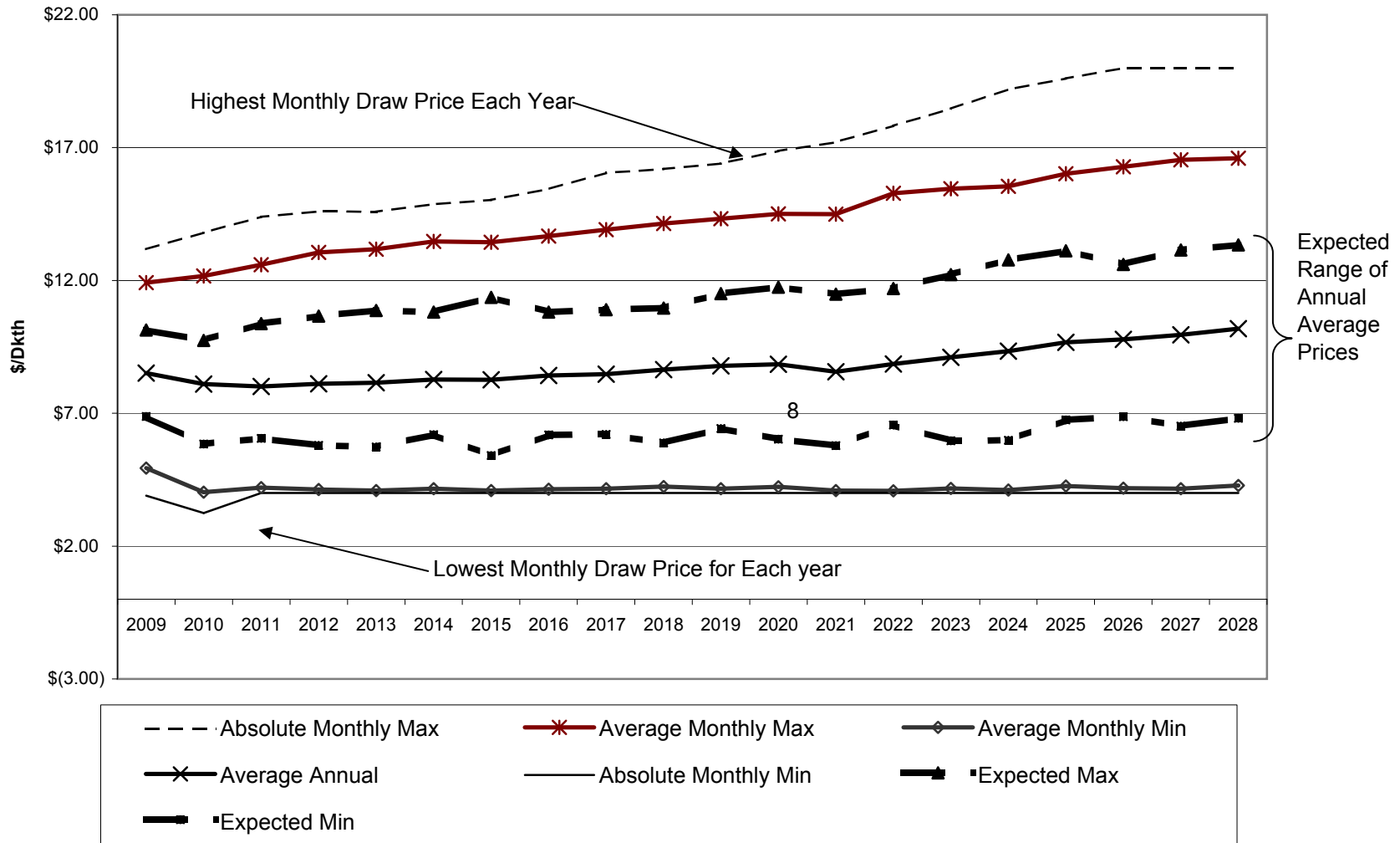
**Total System Annual Load Forecast
Monte-Carlo Results**

Draw	2022	2023	2024	2025	2026	2027	2028	20 Yr Total
189	399,300	408,450	413,672	418,657	432,192	429,364	440,684	7,428,513
190	397,551	393,252	421,751	413,140	438,464	426,258	433,429	7,391,698
191	408,566	407,327	425,311	429,974	418,930	437,307	436,869	7,381,350
192	392,926	419,530	394,069	423,908	423,171	441,108	446,356	7,371,426
193	391,098	420,609	416,528	387,538	445,239	441,794	446,350	7,398,934
194	380,512	399,936	419,617	416,539	437,443	429,780	438,066	7,324,321
195	393,506	399,678	405,259	409,460	422,111	444,944	432,553	7,323,461
196	397,362	396,199	401,117	405,316	429,391	445,031	431,849	7,372,840
197	401,837	405,356	412,842	437,464	417,814	457,263	450,376	7,405,865
198	399,454	403,738	404,894	414,622	428,390	447,928	455,882	7,403,682
199	390,660	389,552	415,739	410,490	427,870	447,178	440,707	7,364,941
200	384,238	407,156	412,107	408,866	430,927	428,873	419,384	7,284,628
Max	425,281	441,394	436,751	442,752	455,115	462,449	476,291	7,492,880
Min	369,401	379,884	387,914	387,538	403,827	405,276	403,472	7,284,628
Average	396,295	403,205	411,880	418,504	428,391	435,051	441,907	7,388,744

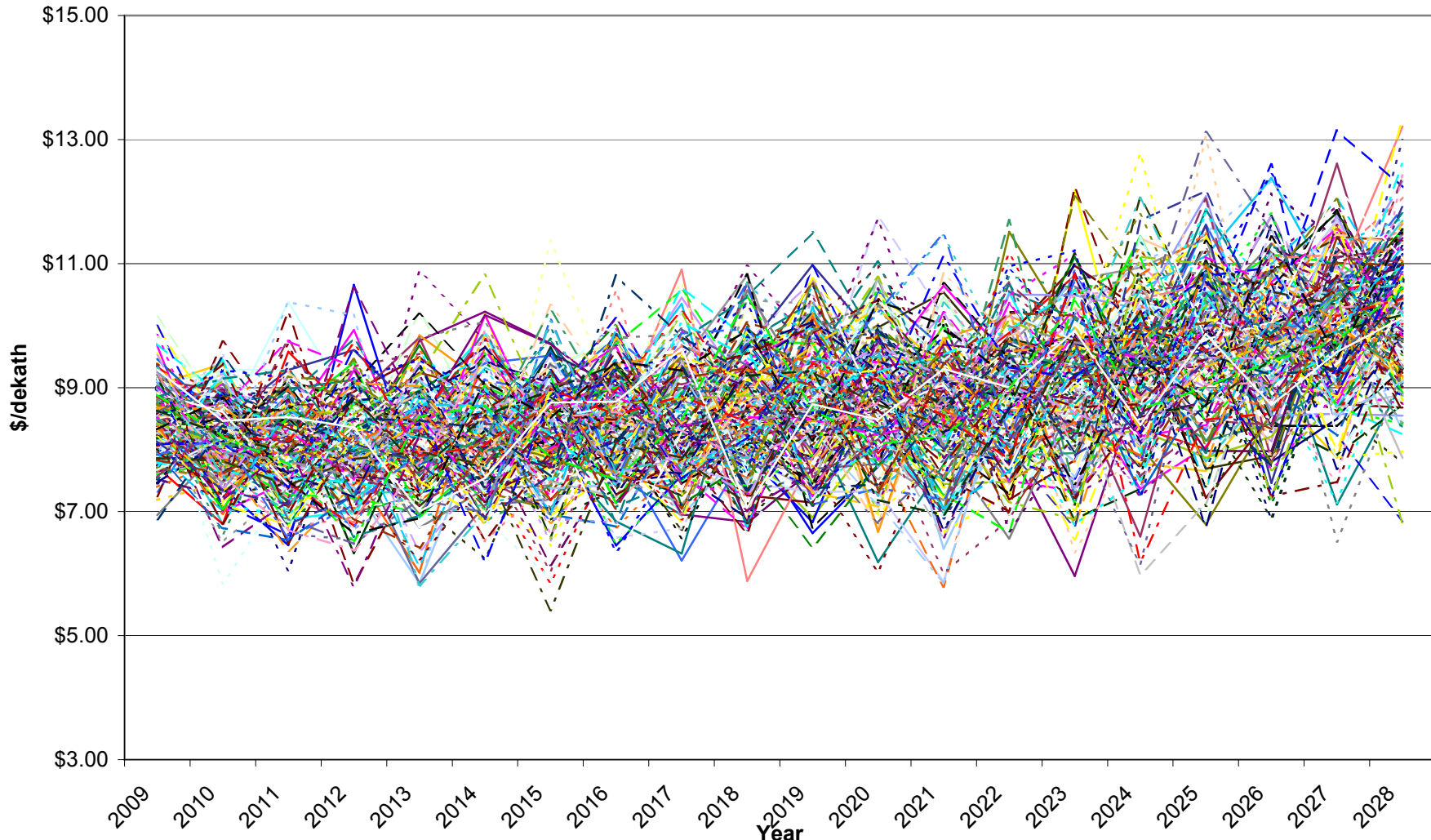
Appendix G-2

Price Uncertainty Analysis

NYMEX Annual Price Forecast



NYMEX ANNUAL AVERAGE PRICE



Nymex Detail-Annual Ranges

Draw	2009			2010			2011		
	max	min	avg	max	min	avg	max	min	avg
1	\$12.33	\$4.31	\$8.52	\$13.80	\$4.73	\$9.06	\$14.00	\$4.00	\$8.39
2	\$10.99	\$4.12	\$7.85	\$11.81	\$3.47	\$8.17	\$9.14	\$4.00	\$6.90
3	\$11.52	\$4.89	\$8.42	\$11.73	\$3.95	\$7.93	\$11.05	\$4.57	\$7.73
4	\$12.80	\$5.95	\$8.77	\$13.40	\$4.05	\$8.97	\$12.08	\$4.00	\$7.43
5	\$12.57	\$5.14	\$8.58	\$13.39	\$4.68	\$8.75	\$12.43	\$4.00	\$8.45
6	\$13.18	\$6.04	\$8.93	\$11.58	\$4.39	\$7.74	\$13.52	\$4.00	\$7.18
7	\$11.22	\$4.03	\$8.02	\$13.24	\$3.38	\$7.37	\$12.03	\$4.00	\$6.46
8	\$11.87	\$5.93	\$8.58	\$13.18	\$4.00	\$8.51	\$13.66	\$4.00	\$8.61
9	\$12.34	\$4.18	\$7.79	\$11.88	\$3.79	\$8.35	\$12.43	\$7.15	\$10.38
10	\$11.77	\$5.39	\$9.06	\$11.16	\$5.54	\$9.27	\$11.90	\$4.31	\$7.67
11	\$10.09	\$5.73	\$8.17	\$13.40	\$3.32	\$8.41	\$11.40	\$4.00	\$8.41
12	\$12.66	\$4.16	\$7.96	\$13.06	\$5.34	\$9.17	\$10.83	\$4.13	\$7.34
13	\$11.69	\$4.03	\$7.92	\$12.48	\$3.32	\$7.92	\$13.66	\$4.00	\$7.37
14	\$11.73	\$4.89	\$8.19	\$13.43	\$3.43	\$7.32	\$13.54	\$4.00	\$7.80
15	\$11.63	\$4.29	\$7.67	\$11.81	\$4.20	\$7.54	\$11.20	\$4.00	\$7.51
16	\$11.60	\$6.95	\$9.09	\$13.20	\$3.59	\$7.92	\$12.43	\$5.41	\$8.87
17	\$12.80	\$4.23	\$8.69	\$10.73	\$3.24	\$6.80	\$12.31	\$4.00	\$8.50
18	\$11.75	\$4.78	\$8.76	\$13.80	\$4.34	\$8.53	\$14.06	\$4.00	\$8.43
19	\$12.80	\$4.87	\$9.05	\$12.92	\$5.92	\$9.39	\$12.43	\$4.00	\$7.45
20	\$12.45	\$4.07	\$8.34	\$13.06	\$3.24	\$7.73	\$12.74	\$4.00	\$7.91
21	\$11.13	\$6.75	\$9.02	\$11.21	\$3.58	\$7.56	\$12.43	\$4.00	\$7.68
22	\$12.80	\$5.41	\$8.83	\$12.51	\$3.38	\$7.69	\$11.04	\$4.00	\$7.46
23	\$11.13	\$5.12	\$8.26	\$10.47	\$3.77	\$7.47	\$10.79	\$4.03	\$8.19
24	\$11.60	\$4.51	\$8.21	\$12.06	\$3.38	\$8.93	\$14.00	\$4.00	\$8.54
25	\$12.49	\$5.08	\$8.55	\$11.63	\$4.68	\$7.90	\$14.01	\$4.77	\$9.05
26	\$12.80	\$4.07	\$9.21	\$12.46	\$4.27	\$8.12	\$12.48	\$4.00	\$8.81
27	\$11.83	\$5.18	\$8.56	\$13.21	\$5.03	\$8.88	\$14.06	\$4.00	\$8.34
28	\$11.37	\$5.32	\$7.92	\$13.40	\$3.62	\$8.04	\$11.04	\$4.26	\$7.07
29	\$12.02	\$6.62	\$9.13	\$12.48	\$5.78	\$8.94	\$10.92	\$5.30	\$8.00
30	\$12.73	\$4.26	\$8.40	\$13.40	\$5.04	\$8.47	\$13.89	\$5.48	\$9.29
31	\$11.47	\$7.15	\$8.92	\$11.76	\$4.43	\$8.20	\$12.32	\$4.00	\$8.50
32	\$12.39	\$6.64	\$8.98	\$13.39	\$3.38	\$7.20	\$12.35	\$4.00	\$7.88
33	\$10.71	\$4.03	\$7.71	\$11.89	\$3.65	\$6.80	\$12.55	\$5.86	\$9.58
34	\$11.92	\$6.10	\$8.68	\$13.06	\$3.38	\$8.35	\$11.56	\$4.00	\$6.78
35	\$13.18	\$5.28	\$9.23	\$13.73	\$4.73	\$8.44	\$11.80	\$4.25	\$8.24
36	\$11.68	\$3.96	\$8.20	\$13.40	\$3.43	\$8.51	\$10.29	\$4.00	\$7.70
37	\$12.68	\$5.90	\$9.67	\$11.88	\$3.89	\$6.99	\$13.09	\$4.00	\$7.49
38	\$11.96	\$6.03	\$8.43	\$13.80	\$5.62	\$9.45	\$10.10	\$4.00	\$6.88
39	\$12.80	\$4.12	\$8.72	\$11.94	\$4.60	\$8.83	\$9.07	\$4.00	\$6.48
40	\$13.18	\$6.63	\$9.14	\$10.46	\$3.38	\$7.03	\$14.40	\$4.00	\$8.70
41	\$13.18	\$4.75	\$8.56	\$13.40	\$3.38	\$8.85	\$12.48	\$4.27	\$7.38
42	\$12.80	\$6.58	\$9.29	\$11.88	\$3.68	\$8.23	\$13.87	\$5.93	\$9.09
43	\$12.17	\$4.89	\$8.42	\$13.19	\$3.32	\$7.64	\$13.92	\$4.00	\$8.18
44	\$11.87	\$4.88	\$9.13	\$11.89	\$3.76	\$8.08	\$13.00	\$5.01	\$8.98
45	\$12.81	\$3.89	\$7.62	\$12.69	\$4.91	\$8.20	\$11.17	\$4.00	\$7.72
46	\$11.08	\$4.45	\$6.94	\$13.11	\$3.43	\$8.07	\$11.63	\$4.00	\$7.63
47	\$12.80	\$4.33	\$9.09	\$12.20	\$5.41	\$8.78	\$13.66	\$4.00	\$8.20
48	\$11.07	\$3.89	\$8.57	\$11.88	\$3.24	\$7.63	\$14.00	\$4.00	\$9.11
49	\$11.87	\$4.32	\$8.39	\$12.26	\$3.38	\$7.04	\$11.86	\$6.09	\$8.55
50	\$11.28	\$4.03	\$8.21	\$13.43	\$3.47	\$9.29	\$12.84	\$4.00	\$9.28
51	\$12.80	\$4.12	\$8.29	\$10.66	\$5.57	\$8.33	\$13.66	\$4.03	\$8.40
52	\$12.80	\$5.40	\$8.35	\$11.59	\$4.05	\$7.87	\$11.20	\$4.00	\$7.23

Nymex Detail-Annual Ranges

Draw	2009			2010			2011		
	max	min	avg	max	min	avg	max	min	avg
53	\$12.81	\$5.29	\$9.46	\$13.26	\$3.56	\$8.46	\$10.41	\$4.00	\$7.45
54	\$12.82	\$5.23	\$8.98	\$11.48	\$4.50	\$8.53	\$12.50	\$4.00	\$8.26
55	\$10.58	\$5.16	\$7.74	\$13.34	\$4.08	\$8.11	\$13.15	\$4.00	\$7.67
56	\$12.45	\$5.31	\$9.01	\$11.89	\$6.22	\$8.49	\$12.50	\$4.00	\$7.45
57	\$11.32	\$8.50	\$9.96	\$11.81	\$3.24	\$8.36	\$12.23	\$4.00	\$7.43
58	\$12.82	\$6.41	\$9.71	\$12.48	\$3.32	\$8.86	\$13.78	\$4.00	\$8.28
59	\$10.09	\$5.44	\$7.65	\$12.54	\$3.56	\$7.84	\$11.76	\$4.00	\$7.65
60	\$12.80	\$4.68	\$8.78	\$11.21	\$3.43	\$6.81	\$13.06	\$4.00	\$8.78
61	\$12.81	\$5.64	\$8.78	\$13.43	\$4.80	\$8.79	\$14.06	\$4.83	\$8.86
62	\$12.80	\$7.03	\$9.99	\$11.94	\$3.93	\$7.83	\$12.55	\$4.00	\$8.24
63	\$12.07	\$4.71	\$8.18	\$11.93	\$3.38	\$8.07	\$13.99	\$4.00	\$8.61
64	\$11.47	\$4.24	\$8.26	\$11.81	\$3.38	\$7.63	\$13.09	\$4.00	\$9.10
65	\$12.81	\$6.50	\$10.14	\$12.50	\$3.38	\$8.54	\$13.66	\$4.02	\$6.90
66	\$11.32	\$4.69	\$9.13	\$11.00	\$3.55	\$7.68	\$14.40	\$4.03	\$8.21
67	\$10.91	\$6.22	\$8.89	\$12.48	\$4.68	\$8.24	\$12.30	\$4.00	\$7.98
68	\$10.78	\$6.76	\$8.63	\$11.49	\$4.88	\$8.27	\$12.50	\$4.03	\$9.02
69	\$12.80	\$5.07	\$8.78	\$12.01	\$4.27	\$9.22	\$12.10	\$4.86	\$7.38
70	\$11.75	\$5.60	\$8.38	\$12.24	\$3.93	\$8.40	\$13.53	\$4.00	\$7.46
71	\$12.15	\$4.03	\$7.33	\$10.57	\$5.71	\$8.90	\$11.64	\$4.00	\$8.72
72	\$11.78	\$5.31	\$9.05	\$10.30	\$3.38	\$7.57	\$14.01	\$4.00	\$7.94
73	\$11.27	\$3.96	\$8.29	\$13.43	\$3.24	\$9.12	\$11.68	\$4.00	\$6.87
74	\$12.33	\$5.25	\$8.57	\$11.03	\$3.38	\$7.91	\$13.37	\$4.75	\$8.73
75	\$11.89	\$4.03	\$7.96	\$11.72	\$3.43	\$7.88	\$9.81	\$4.00	\$6.37
76	\$11.31	\$5.64	\$8.41	\$13.25	\$3.72	\$7.54	\$12.48	\$4.00	\$8.09
77	\$12.81	\$4.03	\$8.67	\$11.74	\$3.32	\$8.61	\$10.52	\$4.00	\$7.11
78	\$10.73	\$6.47	\$8.99	\$11.74	\$4.05	\$8.43	\$13.21	\$4.00	\$7.93
79	\$10.54	\$4.03	\$7.70	\$12.78	\$4.35	\$9.50	\$11.38	\$4.65	\$8.10
80	\$12.81	\$4.68	\$8.60	\$12.30	\$3.68	\$8.63	\$12.55	\$4.00	\$8.54
81	\$12.13	\$4.88	\$9.14	\$11.94	\$3.56	\$7.29	\$14.01	\$4.00	\$8.17
82	\$11.27	\$5.91	\$9.25	\$12.29	\$4.05	\$7.65	\$11.25	\$4.75	\$7.97
83	\$12.82	\$4.84	\$9.28	\$12.50	\$4.41	\$8.16	\$14.11	\$4.00	\$8.71
84	\$10.79	\$4.89	\$8.29	\$11.98	\$3.48	\$7.66	\$12.55	\$4.00	\$9.78
85	\$11.38	\$3.89	\$8.09	\$13.45	\$3.38	\$8.16	\$8.76	\$4.00	\$6.79
86	\$11.87	\$5.25	\$8.18	\$11.88	\$4.61	\$8.54	\$14.06	\$4.00	\$8.66
87	\$12.82	\$6.63	\$9.23	\$12.71	\$3.43	\$7.99	\$12.61	\$4.00	\$8.10
88	\$12.09	\$5.39	\$9.35	\$11.88	\$4.05	\$8.57	\$14.40	\$4.00	\$7.47
89	\$12.45	\$4.03	\$7.60	\$11.94	\$3.24	\$7.81	\$12.50	\$4.00	\$7.27
90	\$12.45	\$5.53	\$8.95	\$12.73	\$3.38	\$7.13	\$11.19	\$4.00	\$6.62
91	\$12.82	\$5.13	\$9.55	\$12.48	\$3.38	\$7.15	\$12.07	\$4.00	\$7.92
92	\$11.96	\$4.59	\$8.73	\$11.71	\$5.05	\$8.69	\$12.43	\$4.00	\$9.75
93	\$12.14	\$4.03	\$7.73	\$13.34	\$4.67	\$9.24	\$9.85	\$4.00	\$7.76
94	\$9.88	\$4.52	\$7.25	\$13.18	\$5.98	\$9.74	\$12.27	\$4.89	\$8.22
95	\$12.41	\$4.29	\$8.19	\$13.39	\$5.40	\$8.70	\$12.09	\$4.00	\$7.13
96	\$11.57	\$4.03	\$8.64	\$13.40	\$3.59	\$8.31	\$11.50	\$4.00	\$7.70
97	\$11.32	\$4.69	\$7.71	\$9.40	\$4.05	\$7.51	\$13.78	\$4.00	\$9.17
98	\$11.56	\$5.32	\$8.76	\$9.80	\$3.32	\$6.42	\$12.55	\$4.00	\$7.18
99	\$12.82	\$5.16	\$8.49	\$10.87	\$3.38	\$7.50	\$13.38	\$4.00	\$8.63
100	\$12.45	\$5.13	\$8.42	\$10.91	\$3.47	\$7.85	\$13.88	\$4.46	\$8.26
101	\$11.22	\$4.03	\$8.37	\$13.40	\$3.38	\$7.39	\$13.09	\$4.00	\$8.51
102	\$11.64	\$5.60	\$8.99	\$11.89	\$3.38	\$8.10	\$14.00	\$4.00	\$7.45
103	\$12.50	\$4.20	\$8.50	\$12.01	\$3.81	\$8.53	\$11.85	\$4.46	\$8.23
104	\$12.04	\$4.07	\$8.50	\$11.89	\$3.38	\$8.72	\$11.64	\$4.00	\$7.80

Nymex Detail-Annual Ranges

Draw	2009			2010			2011		
	max	min	avg	max	min	avg	max	min	avg
105	\$12.80	\$3.89	\$7.89	\$12.85	\$4.63	\$9.28	\$11.85	\$4.00	\$8.51
106	\$11.66	\$4.12	\$7.52	\$11.14	\$3.43	\$7.24	\$12.02	\$6.50	\$8.44
107	\$11.83	\$6.12	\$9.20	\$12.21	\$3.68	\$7.61	\$11.98	\$4.00	\$7.53
108	\$10.96	\$3.89	\$7.92	\$9.19	\$3.56	\$6.74	\$10.94	\$4.00	\$6.54
109	\$11.01	\$4.03	\$7.45	\$12.84	\$3.43	\$8.26	\$14.40	\$4.10	\$8.65
110	\$11.87	\$4.27	\$8.78	\$11.25	\$5.28	\$8.31	\$9.89	\$4.00	\$6.05
111	\$12.45	\$4.03	\$9.85	\$10.05	\$3.47	\$7.36	\$13.09	\$4.00	\$7.14
112	\$11.93	\$5.26	\$8.79	\$13.19	\$3.56	\$8.01	\$11.61	\$4.11	\$8.43
113	\$11.27	\$5.77	\$8.79	\$11.88	\$3.56	\$8.01	\$14.01	\$4.00	\$7.57
114	\$11.32	\$4.97	\$8.37	\$11.74	\$4.05	\$7.49	\$12.94	\$4.25	\$9.33
115	\$12.82	\$4.41	\$8.24	\$11.74	\$3.67	\$7.70	\$14.40	\$4.00	\$9.69
116	\$11.27	\$4.88	\$8.09	\$12.67	\$4.05	\$8.34	\$14.06	\$4.00	\$8.44
117	\$11.62	\$4.03	\$8.73	\$11.31	\$4.52	\$8.88	\$11.64	\$4.00	\$7.60
118	\$10.77	\$5.96	\$7.84	\$11.81	\$3.51	\$8.19	\$12.84	\$4.00	\$7.20
119	\$11.74	\$5.32	\$8.49	\$12.48	\$3.68	\$9.00	\$13.21	\$4.00	\$7.64
120	\$12.80	\$4.20	\$9.81	\$13.39	\$5.73	\$8.66	\$12.19	\$4.00	\$6.79
121	\$12.80	\$4.64	\$8.66	\$12.48	\$3.24	\$8.04	\$12.50	\$4.03	\$7.58
122	\$12.10	\$5.06	\$9.12	\$11.72	\$4.53	\$7.67	\$13.38	\$7.21	\$10.38
123	\$11.02	\$3.91	\$8.02	\$11.88	\$6.42	\$8.71	\$12.78	\$4.00	\$7.95
124	\$12.80	\$4.82	\$8.34	\$12.10	\$4.03	\$8.66	\$13.36	\$4.00	\$9.16
125	\$11.03	\$6.55	\$8.91	\$11.72	\$6.91	\$9.21	\$12.81	\$4.34	\$8.20
126	\$12.81	\$5.68	\$8.60	\$11.08	\$5.15	\$8.34	\$12.48	\$4.00	\$7.35
127	\$11.87	\$4.07	\$8.55	\$11.08	\$5.32	\$7.73	\$14.00	\$4.00	\$8.89
128	\$11.87	\$4.20	\$8.80	\$11.74	\$4.02	\$7.69	\$11.27	\$4.28	\$8.18
129	\$10.37	\$4.82	\$7.19	\$13.40	\$4.05	\$7.47	\$12.38	\$5.54	\$8.15
130	\$12.45	\$5.26	\$9.38	\$13.42	\$3.27	\$7.93	\$13.65	\$4.00	\$7.72
131	\$11.26	\$4.49	\$7.66	\$13.30	\$3.38	\$8.79	\$13.78	\$4.40	\$9.31
132	\$13.18	\$6.47	\$9.03	\$12.94	\$4.15	\$8.64	\$9.95	\$4.00	\$6.64
133	\$11.27	\$4.07	\$8.38	\$8.74	\$3.47	\$6.51	\$13.09	\$4.00	\$7.39
134	\$12.35	\$3.96	\$7.52	\$12.04	\$3.24	\$8.88	\$12.55	\$4.00	\$8.94
135	\$11.27	\$5.84	\$8.77	\$13.06	\$3.24	\$6.63	\$14.40	\$4.00	\$8.86
136	\$11.06	\$5.29	\$8.01	\$10.62	\$5.11	\$7.27	\$12.55	\$4.00	\$7.46
137	\$11.87	\$5.59	\$9.32	\$9.74	\$3.32	\$7.09	\$10.95	\$4.00	\$7.31
138	\$12.54	\$4.31	\$9.38	\$12.98	\$5.35	\$8.87	\$13.66	\$4.00	\$8.12
139	\$10.71	\$4.03	\$7.86	\$11.95	\$4.27	\$8.01	\$12.50	\$4.00	\$7.24
140	\$11.32	\$5.77	\$9.34	\$12.32	\$3.68	\$7.63	\$13.77	\$4.03	\$9.40
141	\$13.18	\$4.54	\$8.63	\$11.39	\$5.26	\$8.23	\$13.66	\$5.99	\$9.12
142	\$12.80	\$5.24	\$8.90	\$13.43	\$3.47	\$8.61	\$11.14	\$4.45	\$7.42
143	\$11.27	\$4.20	\$8.34	\$11.88	\$3.56	\$7.23	\$14.00	\$4.00	\$8.42
144	\$11.59	\$5.12	\$8.73	\$13.43	\$4.38	\$8.13	\$12.55	\$4.00	\$7.70
145	\$13.03	\$3.89	\$8.61	\$13.40	\$3.68	\$9.28	\$14.06	\$4.26	\$9.16
146	\$12.82	\$5.58	\$8.89	\$13.80	\$3.24	\$8.14	\$13.50	\$4.00	\$8.74
147	\$12.80	\$4.03	\$8.52	\$13.43	\$4.90	\$7.98	\$14.06	\$4.00	\$7.92
148	\$12.82	\$4.65	\$8.60	\$11.89	\$3.38	\$7.12	\$11.34	\$4.11	\$6.93
149	\$12.73	\$3.96	\$8.06	\$12.83	\$3.80	\$8.23	\$12.86	\$4.00	\$7.38
150	\$11.22	\$3.89	\$7.83	\$11.67	\$3.47	\$8.39	\$12.20	\$4.00	\$6.84
151	\$12.11	\$4.54	\$7.45	\$11.94	\$4.90	\$8.90	\$12.74	\$4.00	\$7.53
152	\$11.09	\$4.88	\$8.35	\$11.21	\$3.78	\$7.80	\$14.01	\$4.00	\$7.58
153	\$11.27	\$4.03	\$7.83	\$13.03	\$3.24	\$8.97	\$13.29	\$4.00	\$8.77
154	\$9.12	\$5.78	\$7.53	\$12.02	\$3.32	\$8.15	\$12.25	\$4.00	\$7.80
155	\$12.68	\$5.32	\$8.60	\$11.37	\$3.43	\$7.69	\$14.01	\$4.00	\$8.73
156	\$12.82	\$5.15	\$8.80	\$13.80	\$6.05	\$8.75	\$13.03	\$4.00	\$8.12

Nymex Detail-Annual Ranges

Draw	2009			2010			2011		
	max	min	avg	max	min	avg	max	min	avg
157	\$12.13	\$5.92	\$9.22	\$10.99	\$5.07	\$7.43	\$12.19	\$4.06	\$7.97
158	\$12.80	\$5.73	\$9.12	\$12.08	\$3.64	\$7.92	\$13.40	\$4.00	\$8.63
159	\$11.32	\$4.12	\$8.35	\$13.43	\$3.47	\$8.41	\$13.72	\$4.00	\$7.60
160	\$12.82	\$4.20	\$9.14	\$7.85	\$3.24	\$5.84	\$11.52	\$4.00	\$7.46
161	\$11.35	\$6.14	\$8.63	\$13.39	\$3.43	\$6.99	\$11.43	\$4.00	\$8.66
162	\$11.45	\$5.00	\$8.58	\$12.48	\$3.24	\$7.81	\$9.47	\$4.00	\$6.73
163	\$11.32	\$4.03	\$7.40	\$13.06	\$3.32	\$7.82	\$13.09	\$4.00	\$7.98
164	\$10.54	\$5.36	\$8.55	\$12.80	\$4.83	\$9.52	\$12.48	\$4.00	\$7.68
165	\$11.32	\$4.03	\$7.46	\$12.18	\$3.38	\$8.16	\$13.98	\$4.00	\$7.61
166	\$12.37	\$4.32	\$9.00	\$11.74	\$3.64	\$7.88	\$12.43	\$4.26	\$8.32
167	\$12.80	\$3.96	\$8.20	\$10.11	\$3.47	\$7.12	\$9.63	\$4.00	\$6.78
168	\$12.45	\$4.03	\$7.79	\$11.90	\$3.38	\$7.64	\$14.06	\$4.00	\$7.55
169	\$11.85	\$4.99	\$8.44	\$9.22	\$3.38	\$7.18	\$13.65	\$4.00	\$8.06
170	\$11.59	\$4.03	\$7.96	\$10.98	\$3.24	\$7.35	\$14.06	\$5.10	\$10.21
171	\$11.40	\$6.59	\$8.85	\$13.39	\$5.85	\$9.14	\$12.49	\$4.00	\$9.28
172	\$12.08	\$4.20	\$8.09	\$13.43	\$5.05	\$8.11	\$12.35	\$4.00	\$7.39
173	\$11.27	\$4.68	\$7.95	\$10.68	\$3.32	\$7.00	\$12.35	\$4.00	\$8.66
174	\$10.53	\$3.89	\$7.67	\$11.30	\$4.56	\$8.18	\$13.09	\$4.00	\$6.85
175	\$11.27	\$5.49	\$8.74	\$12.42	\$3.47	\$8.18	\$14.40	\$4.62	\$8.01
176	\$11.42	\$4.96	\$8.57	\$12.86	\$3.43	\$9.38	\$12.33	\$4.00	\$6.98
177	\$11.20	\$4.03	\$8.27	\$11.67	\$4.68	\$8.36	\$14.01	\$4.00	\$8.33
178	\$12.01	\$5.43	\$8.67	\$11.57	\$3.43	\$7.58	\$12.35	\$4.00	\$6.70
179	\$13.18	\$5.12	\$9.52	\$10.92	\$3.38	\$7.38	\$12.48	\$5.30	\$8.91
180	\$12.39	\$4.67	\$8.64	\$12.48	\$3.96	\$8.08	\$13.78	\$4.03	\$9.26
181	\$12.80	\$4.76	\$7.91	\$12.92	\$3.38	\$8.20	\$9.96	\$4.00	\$6.57
182	\$10.75	\$6.48	\$9.32	\$12.29	\$3.38	\$7.57	\$11.42	\$4.00	\$7.02
183	\$12.81	\$5.62	\$8.43	\$12.48	\$5.17	\$8.06	\$13.66	\$4.00	\$8.64
184	\$12.00	\$4.03	\$8.34	\$11.00	\$3.38	\$7.34	\$11.31	\$4.00	\$7.99
185	\$11.13	\$5.25	\$8.67	\$10.84	\$4.89	\$8.66	\$14.06	\$4.00	\$8.12
186	\$11.40	\$3.96	\$8.37	\$10.82	\$3.32	\$6.97	\$12.50	\$4.00	\$8.97
187	\$11.32	\$4.03	\$8.61	\$13.06	\$4.68	\$9.05	\$14.40	\$4.00	\$6.88
188	\$12.82	\$6.16	\$9.24	\$13.40	\$3.43	\$7.96	\$14.40	\$4.00	\$7.81
189	\$9.55	\$4.07	\$6.88	\$10.87	\$6.02	\$8.38	\$12.89	\$4.00	\$8.11
190	\$11.69	\$4.03	\$8.48	\$12.87	\$4.22	\$8.10	\$13.78	\$4.21	\$7.93
191	\$11.50	\$4.03	\$8.63	\$12.84	\$4.85	\$8.23	\$11.73	\$4.00	\$7.95
192	\$12.35	\$4.07	\$7.86	\$13.39	\$3.68	\$7.82	\$11.77	\$4.00	\$7.42
193	\$11.36	\$4.20	\$7.83	\$11.74	\$3.32	\$7.61	\$12.50	\$5.05	\$8.20
194	\$12.80	\$4.03	\$7.55	\$11.94	\$3.47	\$8.49	\$12.35	\$5.02	\$8.08
195	\$11.84	\$4.03	\$8.14	\$11.88	\$3.68	\$7.34	\$11.72	\$4.00	\$7.12
196	\$12.80	\$4.03	\$8.32	\$11.89	\$5.23	\$8.83	\$11.85	\$4.00	\$7.51
197	\$12.82	\$6.73	\$9.29	\$11.81	\$4.96	\$8.46	\$12.65	\$4.00	\$8.52
198	\$12.53	\$4.96	\$8.87	\$13.39	\$4.45	\$8.22	\$14.00	\$4.00	\$8.14
199	\$11.54	\$6.33	\$8.89	\$11.64	\$3.32	\$8.21	\$12.90	\$4.00	\$7.76
200	\$10.73	\$4.88	\$7.66	\$13.20	\$4.72	\$8.91	\$14.01	\$4.00	\$8.19
average	\$11.92	\$4.93	\$8.51	\$12.17	\$4.03	\$8.10	\$12.59	\$4.20	\$8.01
Max	\$13.18			\$13.80			\$14.40		
Avg			\$8.51			\$8.10			\$8.01
Min	\$3.89			\$3.24			\$4.00		
Range	9.28			10.56			10.40		

Nymex Detail-Annual Ranges

Draw	2012			2013			2014		
	max	min	avg	max	min	avg	max	min	avg
1	\$13.10	\$5.55	\$9.93	\$13.65	\$4.00	\$7.47	\$11.79	\$5.88	\$9.35
2	\$13.15	\$4.00	\$8.02	\$13.09	\$4.00	\$7.58	\$13.50	\$4.00	\$10.19
3	\$11.37	\$4.00	\$7.93	\$13.65	\$4.00	\$8.72	\$13.42	\$4.13	\$9.87
4	\$14.19	\$4.00	\$8.01	\$13.37	\$4.00	\$9.75	\$13.90	\$4.00	\$10.23
5	\$13.03	\$4.00	\$8.94	\$13.27	\$5.20	\$9.49	\$14.87	\$4.00	\$8.62
6	\$13.19	\$4.00	\$8.52	\$13.65	\$4.00	\$7.58	\$13.25	\$4.00	\$8.54
7	\$13.19	\$5.00	\$10.66	\$11.57	\$4.00	\$7.31	\$14.28	\$4.00	\$7.55
8	\$14.02	\$4.00	\$8.63	\$14.59	\$4.00	\$8.27	\$13.42	\$4.00	\$9.32
9	\$12.97	\$4.00	\$8.63	\$12.97	\$4.00	\$7.95	\$13.50	\$4.00	\$8.20
10	\$12.97	\$4.00	\$7.85	\$11.57	\$4.00	\$7.45	\$14.20	\$4.00	\$8.51
11	\$13.19	\$4.00	\$9.32	\$12.74	\$4.00	\$7.49	\$13.42	\$4.00	\$7.94
12	\$13.09	\$4.00	\$7.39	\$11.63	\$4.00	\$5.85	\$14.65	\$4.53	\$8.50
13	\$12.97	\$4.00	\$8.10	\$12.97	\$4.01	\$7.96	\$13.42	\$5.28	\$9.49
14	\$12.97	\$4.00	\$7.42	\$14.02	\$4.00	\$8.52	\$13.37	\$4.00	\$8.13
15	\$13.15	\$4.00	\$8.88	\$13.09	\$4.00	\$7.80	\$13.42	\$4.00	\$8.36
16	\$13.27	\$4.00	\$7.30	\$13.65	\$4.00	\$8.61	\$13.50	\$4.00	\$9.39
17	\$13.27	\$4.00	\$7.30	\$12.97	\$4.00	\$7.32	\$13.37	\$4.00	\$9.00
18	\$14.60	\$4.00	\$8.73	\$14.37	\$4.00	\$8.42	\$13.90	\$4.00	\$8.87
19	\$13.19	\$4.19	\$7.92	\$13.03	\$4.00	\$8.54	\$12.35	\$4.00	\$7.78
20	\$12.97	\$4.00	\$7.19	\$13.27	\$4.00	\$9.84	\$14.87	\$4.00	\$9.06
21	\$13.65	\$5.26	\$7.66	\$13.09	\$4.00	\$6.02	\$13.90	\$6.42	\$9.67
22	\$14.02	\$4.00	\$8.11	\$14.07	\$4.00	\$5.84	\$13.50	\$4.00	\$7.11
23	\$14.60	\$4.00	\$7.63	\$11.71	\$4.00	\$7.76	\$13.32	\$4.00	\$8.63
24	\$10.57	\$4.00	\$8.01	\$14.12	\$4.00	\$9.33	\$11.70	\$4.86	\$7.98
25	\$12.34	\$4.00	\$6.98	\$9.61	\$4.00	\$7.27	\$13.42	\$4.00	\$8.29
26	\$13.65	\$4.00	\$6.33	\$12.61	\$5.17	\$8.60	\$12.15	\$4.00	\$7.52
27	\$12.52	\$4.00	\$8.01	\$12.97	\$4.00	\$7.09	\$13.37	\$4.00	\$8.00
28	\$14.24	\$4.00	\$8.49	\$14.02	\$4.00	\$9.24	\$14.65	\$4.00	\$8.97
29	\$12.44	\$6.30	\$8.81	\$14.59	\$4.00	\$9.81	\$13.68	\$4.00	\$7.53
30	\$13.10	\$4.00	\$9.61	\$13.65	\$4.00	\$8.56	\$11.04	\$4.00	\$7.25
31	\$13.27	\$4.00	\$7.59	\$14.59	\$4.00	\$8.37	\$13.50	\$4.00	\$8.60
32	\$13.10	\$4.00	\$9.35	\$10.34	\$4.00	\$8.19	\$13.50	\$4.00	\$6.82
33	\$13.90	\$4.00	\$8.51	\$13.14	\$4.00	\$7.31	\$14.65	\$4.00	\$8.92
34	\$13.19	\$4.00	\$8.76	\$14.02	\$5.75	\$8.94	\$13.50	\$4.00	\$7.03
35	\$13.10	\$4.00	\$7.82	\$14.59	\$4.00	\$6.92	\$11.89	\$5.65	\$8.55
36	\$13.10	\$4.00	\$8.30	\$14.59	\$4.00	\$8.76	\$13.37	\$4.00	\$7.88
37	\$14.02	\$4.00	\$9.28	\$11.65	\$4.00	\$7.41	\$13.25	\$4.01	\$10.17
38	\$11.63	\$4.00	\$7.01	\$13.65	\$4.00	\$8.83	\$14.87	\$4.00	\$8.18
39	\$13.27	\$4.00	\$8.29	\$14.59	\$4.00	\$8.07	\$12.79	\$4.00	\$7.27
40	\$13.27	\$4.00	\$7.96	\$13.09	\$6.73	\$9.68	\$13.32	\$4.00	\$7.92
41	\$13.27	\$4.00	\$8.37	\$14.37	\$4.24	\$8.94	\$14.87	\$4.00	\$9.65
42	\$13.10	\$4.00	\$8.85	\$12.01	\$4.00	\$7.69	\$12.46	\$4.00	\$7.32
43	\$10.74	\$4.00	\$8.17	\$13.03	\$4.00	\$8.41	\$14.87	\$6.43	\$10.17
44	\$14.02	\$5.50	\$9.13	\$11.33	\$4.00	\$7.86	\$12.22	\$4.00	\$7.89
45	\$14.60	\$4.11	\$9.12	\$14.09	\$4.00	\$8.30	\$14.87	\$4.00	\$8.91
46	\$14.02	\$4.00	\$8.25	\$12.15	\$4.00	\$6.74	\$13.42	\$4.00	\$7.37
47	\$13.19	\$4.00	\$8.36	\$13.09	\$4.00	\$8.64	\$13.39	\$4.00	\$8.33
48	\$13.73	\$4.00	\$8.46	\$13.19	\$4.00	\$8.39	\$14.28	\$4.00	\$8.52
49	\$12.97	\$4.00	\$9.41	\$11.72	\$4.00	\$6.91	\$11.69	\$4.00	\$7.91
50	\$11.78	\$4.00	\$8.03	\$11.84	\$4.00	\$8.26	\$14.37	\$5.37	\$9.35
51	\$13.65	\$4.00	\$8.12	\$13.09	\$4.00	\$8.47	\$14.26	\$4.00	\$6.90
52	\$11.51	\$4.00	\$6.82	\$13.38	\$4.00	\$8.60	\$12.28	\$4.00	\$7.90

Nymex Detail-Annual Ranges

Draw	2012			2013			2014		
	max	min	avg	max	min	avg	max	min	avg
53	\$13.33	\$4.00	\$7.96	\$12.16	\$4.20	\$7.76	\$12.94	\$4.80	\$8.17
54	\$14.60	\$4.00	\$7.79	\$13.09	\$4.00	\$9.21	\$12.43	\$4.00	\$7.45
55	\$13.19	\$4.00	\$8.84	\$12.54	\$4.00	\$8.02	\$13.37	\$4.00	\$7.59
56	\$13.27	\$4.00	\$8.13	\$13.03	\$4.00	\$8.62	\$14.87	\$4.00	\$8.09
57	\$14.38	\$4.00	\$8.12	\$13.27	\$4.00	\$7.81	\$13.99	\$4.00	\$9.43
58	\$9.97	\$4.00	\$6.93	\$14.59	\$4.16	\$8.98	\$14.28	\$5.81	\$9.50
59	\$11.65	\$4.00	\$7.78	\$14.59	\$4.00	\$7.47	\$12.75	\$4.00	\$8.13
60	\$13.10	\$4.00	\$5.84	\$13.00	\$4.00	\$7.78	\$12.99	\$4.00	\$8.66
61	\$13.65	\$4.87	\$9.80	\$13.14	\$4.00	\$7.91	\$13.25	\$4.00	\$7.48
62	\$13.65	\$5.32	\$8.16	\$14.59	\$4.00	\$8.71	\$13.32	\$4.00	\$8.51
63	\$12.97	\$4.00	\$8.24	\$10.23	\$4.00	\$6.12	\$14.28	\$4.00	\$8.63
64	\$12.38	\$4.25	\$7.92	\$13.27	\$4.00	\$8.19	\$14.87	\$4.00	\$8.74
65	\$13.65	\$4.00	\$7.72	\$13.83	\$5.57	\$10.23	\$13.31	\$4.00	\$8.23
66	\$13.03	\$4.00	\$8.25	\$12.42	\$4.17	\$8.67	\$14.28	\$4.00	\$6.95
67	\$13.99	\$4.00	\$8.75	\$13.14	\$4.00	\$7.63	\$13.50	\$4.00	\$8.77
68	\$11.25	\$4.00	\$7.67	\$13.03	\$4.00	\$7.32	\$12.90	\$5.06	\$8.33
69	\$13.10	\$4.00	\$8.53	\$12.18	\$4.00	\$6.36	\$14.87	\$4.00	\$7.67
70	\$13.27	\$4.89	\$8.30	\$14.59	\$4.00	\$8.07	\$13.19	\$4.00	\$7.72
71	\$13.74	\$4.00	\$8.27	\$12.62	\$4.00	\$7.73	\$14.87	\$4.00	\$9.13
72	\$13.15	\$4.00	\$7.19	\$13.07	\$4.00	\$7.96	\$14.52	\$4.00	\$7.59
73	\$14.02	\$4.00	\$8.51	\$13.31	\$4.00	\$7.69	\$13.32	\$4.00	\$8.96
74	\$13.29	\$4.00	\$7.66	\$12.90	\$4.51	\$9.03	\$13.19	\$4.00	\$8.59
75	\$12.97	\$4.00	\$7.43	\$14.02	\$4.00	\$8.02	\$13.50	\$4.00	\$8.51
76	\$13.27	\$4.00	\$8.51	\$13.65	\$4.00	\$7.17	\$11.59	\$4.00	\$7.85
77	\$12.97	\$4.00	\$7.91	\$13.40	\$4.00	\$8.45	\$13.39	\$4.00	\$9.89
78	\$14.27	\$4.00	\$8.24	\$13.94	\$4.00	\$8.95	\$13.32	\$4.00	\$7.42
79	\$13.62	\$4.00	\$7.97	\$14.37	\$4.00	\$8.24	\$13.42	\$4.00	\$8.18
80	\$11.07	\$4.00	\$7.26	\$13.65	\$4.00	\$9.12	\$13.32	\$4.00	\$6.83
81	\$13.15	\$4.30	\$9.30	\$11.65	\$4.00	\$7.17	\$14.52	\$4.00	\$8.93
82	\$13.27	\$4.00	\$8.76	\$12.97	\$4.00	\$8.29	\$14.87	\$4.43	\$9.50
83	\$13.10	\$4.00	\$8.75	\$13.03	\$4.00	\$7.52	\$14.87	\$5.01	\$8.75
84	\$13.65	\$4.00	\$7.67	\$12.83	\$4.00	\$7.63	\$13.72	\$4.00	\$8.19
85	\$12.69	\$4.00	\$7.26	\$13.44	\$4.00	\$8.34	\$12.55	\$5.05	\$8.42
86	\$13.81	\$4.00	\$9.07	\$13.27	\$4.00	\$10.18	\$13.35	\$4.00	\$9.06
87	\$13.65	\$4.00	\$8.56	\$12.84	\$4.00	\$6.74	\$10.98	\$4.00	\$7.00
88	\$10.99	\$4.00	\$6.77	\$13.27	\$4.00	\$8.54	\$14.37	\$4.00	\$9.78
89	\$12.04	\$4.00	\$7.23	\$13.65	\$4.00	\$6.97	\$13.65	\$4.44	\$9.03
90	\$14.02	\$4.00	\$9.02	\$13.09	\$4.00	\$8.38	\$13.32	\$4.00	\$7.27
91	\$13.15	\$4.00	\$8.30	\$13.65	\$4.00	\$8.41	\$13.42	\$4.00	\$8.21
92	\$14.60	\$4.00	\$9.33	\$13.27	\$4.00	\$8.31	\$14.28	\$4.00	\$9.59
93	\$12.13	\$4.00	\$8.53	\$13.53	\$4.00	\$8.18	\$13.50	\$4.30	\$8.96
94	\$10.18	\$4.68	\$7.92	\$14.59	\$4.00	\$8.45	\$9.56	\$4.00	\$6.54
95	\$13.37	\$4.00	\$8.34	\$14.08	\$4.00	\$8.93	\$13.37	\$4.00	\$7.73
96	\$13.15	\$4.00	\$8.80	\$12.80	\$4.00	\$8.86	\$13.49	\$4.00	\$9.43
97	\$11.75	\$4.00	\$9.10	\$11.68	\$4.15	\$8.39	\$13.42	\$4.00	\$8.15
98	\$13.47	\$4.67	\$10.61	\$13.05	\$4.00	\$8.55	\$13.19	\$4.00	\$7.88
99	\$10.26	\$4.00	\$6.59	\$14.37	\$4.00	\$6.94	\$13.38	\$4.00	\$7.74
100	\$14.03	\$4.00	\$8.03	\$12.43	\$4.00	\$8.37	\$14.28	\$4.00	\$8.33
101	\$14.38	\$5.60	\$8.21	\$11.43	\$4.00	\$6.97	\$12.91	\$4.00	\$8.62
102	\$13.65	\$4.00	\$7.93	\$14.59	\$4.00	\$8.36	\$13.97	\$4.73	\$8.18
103	\$12.71	\$4.00	\$6.85	\$12.78	\$4.00	\$8.17	\$14.28	\$4.00	\$7.08
104	\$12.40	\$4.00	\$7.08	\$12.21	\$4.00	\$7.17	\$13.87	\$4.00	\$8.89

Nymex Detail-Annual Ranges

Draw	2012			2013			2014		
	max	min	avg	max	min	avg	max	min	avg
105	\$14.60	\$4.00	\$9.13	\$14.02	\$4.00	\$8.59	\$14.02	\$4.00	\$6.82
106	\$14.55	\$4.00	\$7.56	\$13.03	\$4.00	\$7.50	\$13.27	\$4.00	\$8.23
107	\$14.30	\$4.53	\$7.86	\$13.65	\$4.00	\$7.97	\$12.03	\$4.00	\$7.97
108	\$13.03	\$4.00	\$7.29	\$14.59	\$4.00	\$8.83	\$14.87	\$4.00	\$8.71
109	\$13.35	\$4.00	\$7.74	\$12.03	\$4.00	\$8.40	\$11.54	\$4.00	\$7.89
110	\$13.43	\$4.00	\$9.14	\$11.93	\$4.00	\$8.68	\$12.55	\$4.00	\$7.51
111	\$12.18	\$4.00	\$9.17	\$13.45	\$4.00	\$7.88	\$13.90	\$4.00	\$7.40
112	\$13.78	\$4.00	\$7.86	\$11.51	\$4.00	\$7.51	\$12.83	\$4.00	\$7.23
113	\$11.96	\$4.00	\$8.05	\$13.87	\$4.00	\$9.55	\$14.87	\$4.00	\$8.69
114	\$11.90	\$4.00	\$7.00	\$14.59	\$4.00	\$10.87	\$14.65	\$4.00	\$9.76
115	\$11.61	\$4.00	\$7.31	\$13.09	\$4.00	\$6.24	\$13.94	\$4.00	\$7.60
116	\$12.97	\$4.00	\$7.83	\$13.09	\$4.00	\$7.81	\$12.11	\$4.00	\$8.18
117	\$13.27	\$4.00	\$9.14	\$14.06	\$4.00	\$9.44	\$13.32	\$4.00	\$8.90
118	\$13.15	\$4.00	\$7.62	\$11.71	\$4.00	\$8.37	\$13.50	\$4.00	\$8.64
119	\$13.36	\$4.00	\$8.10	\$13.68	\$4.00	\$8.48	\$13.50	\$4.00	\$7.93
120	\$13.19	\$4.00	\$8.11	\$14.59	\$4.00	\$7.37	\$14.28	\$4.00	\$7.43
121	\$13.15	\$4.00	\$9.36	\$14.02	\$4.00	\$8.53	\$10.73	\$4.00	\$6.97
122	\$13.47	\$5.16	\$10.17	\$9.28	\$4.00	\$5.74	\$13.50	\$5.66	\$9.87
123	\$13.11	\$4.06	\$8.98	\$13.14	\$4.00	\$7.42	\$13.38	\$4.34	\$9.91
124	\$12.85	\$4.00	\$8.22	\$14.59	\$4.00	\$8.17	\$13.32	\$4.00	\$8.52
125	\$13.85	\$5.06	\$8.83	\$12.76	\$4.00	\$7.25	\$14.48	\$4.00	\$9.85
126	\$10.58	\$4.00	\$6.76	\$13.43	\$4.00	\$8.73	\$13.25	\$4.00	\$8.54
127	\$13.19	\$4.00	\$8.00	\$12.97	\$4.00	\$6.92	\$12.02	\$4.00	\$7.11
128	\$13.27	\$4.00	\$8.66	\$13.03	\$4.85	\$9.36	\$13.75	\$4.00	\$8.74
129	\$10.76	\$5.11	\$8.05	\$13.27	\$4.00	\$7.78	\$13.90	\$4.00	\$9.82
130	\$13.65	\$4.00	\$8.22	\$14.02	\$4.00	\$8.26	\$13.24	\$4.00	\$9.11
131	\$12.29	\$4.00	\$7.06	\$13.19	\$4.00	\$9.59	\$11.58	\$4.43	\$8.09
132	\$12.93	\$4.00	\$6.55	\$14.37	\$4.00	\$8.66	\$14.28	\$4.00	\$8.86
133	\$12.24	\$4.00	\$6.98	\$13.19	\$4.00	\$8.90	\$12.76	\$4.00	\$8.44
134	\$12.97	\$4.00	\$8.17	\$14.37	\$4.00	\$8.94	\$14.28	\$4.00	\$8.42
135	\$12.83	\$4.00	\$7.56	\$14.59	\$4.00	\$8.53	\$14.65	\$4.00	\$9.03
136	\$13.65	\$4.00	\$9.03	\$13.03	\$4.00	\$8.23	\$13.42	\$4.00	\$7.66
137	\$13.65	\$4.00	\$7.65	\$13.27	\$4.00	\$7.12	\$12.47	\$4.00	\$6.23
138	\$12.62	\$4.00	\$7.74	\$11.93	\$4.00	\$7.26	\$13.90	\$4.00	\$8.25
139	\$14.34	\$4.65	\$9.34	\$14.02	\$5.67	\$9.55	\$14.21	\$4.00	\$7.95
140	\$13.65	\$4.09	\$8.85	\$14.02	\$4.00	\$8.22	\$13.90	\$4.00	\$8.44
141	\$14.02	\$4.00	\$8.75	\$13.09	\$4.00	\$8.40	\$13.56	\$4.52	\$9.29
142	\$13.03	\$4.00	\$8.38	\$14.02	\$4.00	\$9.19	\$13.42	\$4.00	\$7.58
143	\$14.08	\$4.00	\$7.44	\$14.59	\$4.00	\$8.05	\$14.03	\$4.00	\$7.68
144	\$13.15	\$4.00	\$8.44	\$12.74	\$4.00	\$7.14	\$14.87	\$4.00	\$9.55
145	\$14.38	\$4.00	\$7.84	\$14.37	\$4.00	\$8.44	\$12.96	\$4.00	\$7.64
146	\$11.94	\$4.00	\$8.55	\$13.74	\$4.08	\$9.47	\$13.32	\$4.00	\$7.26
147	\$14.02	\$4.00	\$8.47	\$13.27	\$4.00	\$8.42	\$13.12	\$4.48	\$8.91
148	\$13.05	\$4.00	\$8.74	\$13.14	\$4.00	\$8.87	\$12.52	\$4.00	\$9.27
149	\$13.65	\$4.00	\$7.52	\$12.75	\$4.00	\$7.26	\$12.90	\$4.00	\$8.71
150	\$13.19	\$4.00	\$7.61	\$13.44	\$4.00	\$8.99	\$14.46	\$4.00	\$9.42
151	\$12.72	\$4.00	\$7.70	\$13.14	\$4.00	\$8.04	\$12.37	\$4.00	\$7.83
152	\$13.27	\$4.00	\$9.43	\$11.96	\$4.00	\$7.82	\$13.50	\$5.96	\$8.84
153	\$14.02	\$4.00	\$8.65	\$13.74	\$4.00	\$7.82	\$14.28	\$4.00	\$8.93
154	\$14.60	\$4.00	\$7.99	\$12.70	\$4.00	\$8.47	\$13.32	\$4.00	\$7.11
155	\$13.65	\$4.47	\$8.36	\$11.03	\$4.00	\$7.87	\$14.87	\$4.00	\$8.09
156	\$12.88	\$4.00	\$7.13	\$14.15	\$4.78	\$9.80	\$14.28	\$4.00	\$10.06

Nymex Detail-Annual Ranges

Draw	2012			2013			2014		
	max	min	avg	max	min	avg	max	min	avg
157	\$9.80	\$4.00	\$6.71	\$11.05	\$4.00	\$7.39	\$13.62	\$4.00	\$9.47
158	\$13.29	\$4.00	\$8.29	\$14.59	\$4.00	\$8.30	\$14.28	\$4.00	\$8.46
159	\$9.62	\$4.00	\$6.86	\$13.19	\$5.40	\$8.11	\$13.42	\$4.00	\$8.52
160	\$13.27	\$4.08	\$8.31	\$12.71	\$4.00	\$7.43	\$11.55	\$4.00	\$6.89
161	\$13.05	\$4.00	\$7.61	\$14.02	\$4.00	\$9.18	\$12.30	\$4.00	\$7.16
162	\$10.66	\$4.00	\$6.91	\$13.09	\$4.00	\$8.68	\$9.51	\$4.00	\$6.52
163	\$13.23	\$4.00	\$7.86	\$13.78	\$4.00	\$8.77	\$13.90	\$4.00	\$7.87
164	\$14.49	\$4.00	\$7.76	\$13.27	\$4.00	\$8.79	\$13.50	\$4.00	\$8.72
165	\$13.65	\$4.00	\$7.23	\$14.59	\$5.34	\$9.37	\$12.40	\$4.00	\$7.15
166	\$13.28	\$4.00	\$7.52	\$13.48	\$4.00	\$8.53	\$13.90	\$4.00	\$7.18
167	\$13.42	\$4.00	\$8.16	\$14.59	\$4.00	\$7.51	\$14.87	\$4.00	\$6.86
168	\$12.44	\$4.00	\$7.47	\$13.27	\$4.00	\$7.33	\$14.28	\$4.34	\$8.97
169	\$10.71	\$4.00	\$5.79	\$13.49	\$4.00	\$8.22	\$12.06	\$5.88	\$8.99
170	\$13.19	\$4.00	\$6.95	\$13.96	\$4.00	\$8.26	\$13.50	\$4.00	\$7.16
171	\$12.33	\$4.00	\$7.92	\$13.14	\$4.00	\$8.23	\$14.65	\$4.00	\$7.97
172	\$14.60	\$4.00	\$9.63	\$12.63	\$4.00	\$8.66	\$13.37	\$4.00	\$6.20
173	\$13.67	\$4.00	\$8.01	\$13.27	\$4.00	\$8.73	\$13.32	\$4.00	\$8.70
174	\$14.02	\$4.00	\$8.68	\$13.19	\$4.00	\$8.09	\$14.28	\$4.00	\$7.31
175	\$13.19	\$6.19	\$9.45	\$13.19	\$4.00	\$7.41	\$13.19	\$4.00	\$8.19
176	\$12.97	\$4.00	\$8.82	\$13.14	\$4.00	\$7.81	\$13.42	\$5.19	\$8.63
177	\$13.10	\$4.50	\$7.74	\$14.59	\$4.00	\$9.14	\$12.42	\$4.40	\$8.31
178	\$9.02	\$4.00	\$6.38	\$11.03	\$4.00	\$7.79	\$13.38	\$4.00	\$9.47
179	\$11.26	\$4.00	\$7.55	\$13.09	\$4.00	\$9.39	\$14.28	\$4.98	\$8.66
180	\$14.02	\$4.00	\$8.37	\$13.19	\$4.00	\$8.91	\$13.25	\$4.00	\$7.73
181	\$13.15	\$4.00	\$7.11	\$14.02	\$4.00	\$7.96	\$11.81	\$4.00	\$6.87
182	\$14.45	\$4.00	\$9.16	\$9.71	\$4.00	\$5.82	\$12.31	\$4.00	\$6.97
183	\$13.64	\$4.31	\$8.57	\$13.70	\$5.58	\$9.22	\$14.87	\$4.00	\$10.81
184	\$14.38	\$4.00	\$7.78	\$13.14	\$4.00	\$8.46	\$13.42	\$4.00	\$6.79
185	\$13.10	\$5.17	\$9.07	\$13.35	\$4.00	\$9.02	\$14.65	\$4.00	\$7.60
186	\$13.28	\$4.00	\$8.08	\$13.27	\$4.00	\$8.64	\$14.87	\$4.00	\$7.50
187	\$14.02	\$4.00	\$6.48	\$11.95	\$4.00	\$7.20	\$11.57	\$4.00	\$6.98
188	\$10.49	\$4.00	\$7.56	\$14.02	\$4.00	\$8.98	\$12.72	\$4.00	\$7.21
189	\$13.10	\$4.88	\$8.50	\$12.37	\$4.00	\$8.47	\$13.27	\$4.00	\$8.34
190	\$14.02	\$4.00	\$8.04	\$13.65	\$4.22	\$7.81	\$13.42	\$4.00	\$8.17
191	\$13.99	\$4.00	\$8.84	\$12.86	\$4.00	\$7.67	\$14.28	\$4.00	\$8.54
192	\$13.65	\$4.00	\$7.85	\$13.14	\$4.00	\$7.97	\$14.24	\$4.00	\$7.75
193	\$9.64	\$4.00	\$6.88	\$12.01	\$4.00	\$6.42	\$14.87	\$4.00	\$8.10
194	\$14.02	\$4.08	\$7.63	\$14.02	\$4.00	\$7.11	\$13.10	\$4.00	\$7.79
195	\$12.26	\$4.00	\$8.10	\$13.23	\$4.00	\$7.80	\$11.63	\$4.00	\$6.89
196	\$14.60	\$4.00	\$6.65	\$11.17	\$4.00	\$6.90	\$14.28	\$4.00	\$9.11
197	\$12.32	\$4.00	\$8.36	\$12.14	\$4.00	\$7.01	\$12.66	\$4.00	\$7.54
198	\$14.60	\$4.81	\$9.71	\$13.09	\$4.00	\$7.90	\$13.88	\$4.00	\$8.06
199	\$10.58	\$4.00	\$6.54	\$13.96	\$4.00	\$8.52	\$14.87	\$4.00	\$8.71
200	\$13.53	\$4.00	\$8.24	\$13.03	\$4.00	\$8.07	\$13.76	\$5.58	\$7.75
average	\$13.05	\$4.13	\$8.11	\$13.18	\$4.09	\$8.15	\$13.46	\$4.16	\$8.28
Max	\$14.60			\$14.59			\$14.87		
Avg			\$8.11			\$8.15			\$8.28
Min	\$4.00			\$4.00			\$4.00		
Range	10.60			10.59			10.87		

Nymex Detail-Annual Ranges

Draw	2015			2016			2017		
	max	min	avg	max	min	avg	max	min	avg
53	\$14.42	\$4.43	\$9.59	\$13.98	\$4.00	\$7.78	\$14.57	\$4.00	\$8.88
54	\$13.63	\$4.00	\$9.21	\$15.44	\$4.00	\$7.80	\$14.32	\$4.00	\$7.73
55	\$12.79	\$4.00	\$8.23	\$13.98	\$4.00	\$7.48	\$14.49	\$4.00	\$7.60
56	\$14.03	\$4.00	\$8.73	\$13.79	\$4.00	\$9.04	\$16.05	\$4.00	\$7.63
57	\$15.03	\$4.00	\$8.16	\$11.82	\$4.00	\$7.93	\$13.73	\$4.00	\$6.84
58	\$14.09	\$4.00	\$8.60	\$13.78	\$4.91	\$8.59	\$11.86	\$4.00	\$7.57
59	\$13.44	\$4.00	\$7.76	\$14.40	\$4.00	\$8.17	\$15.79	\$4.00	\$7.72
60	\$13.55	\$4.00	\$7.50	\$15.44	\$4.00	\$7.17	\$12.31	\$4.00	\$8.26
61	\$14.79	\$4.00	\$8.98	\$13.38	\$4.00	\$7.71	\$14.38	\$4.00	\$8.72
62	\$14.03	\$4.75	\$8.79	\$13.78	\$4.00	\$10.11	\$14.19	\$4.00	\$8.33
63	\$13.44	\$4.00	\$7.79	\$13.85	\$4.54	\$9.19	\$13.61	\$4.00	\$7.92
64	\$13.31	\$4.00	\$8.75	\$14.81	\$4.00	\$8.82	\$15.02	\$4.00	\$8.82
65	\$13.37	\$4.00	\$7.06	\$13.98	\$4.00	\$8.74	\$14.88	\$4.00	\$7.71
66	\$15.03	\$5.14	\$9.37	\$14.40	\$4.00	\$9.70	\$11.67	\$4.00	\$8.10
67	\$14.03	\$4.00	\$9.11	\$13.76	\$4.74	\$8.32	\$16.01	\$4.00	\$10.21
68	\$13.91	\$5.35	\$8.07	\$13.78	\$4.00	\$9.39	\$12.91	\$4.00	\$8.39
69	\$14.79	\$4.00	\$8.51	\$13.78	\$4.00	\$7.89	\$14.77	\$4.16	\$8.97
70	\$13.49	\$4.00	\$8.07	\$15.20	\$4.00	\$8.32	\$13.52	\$4.00	\$8.74
71	\$13.44	\$4.00	\$8.92	\$13.78	\$4.00	\$9.82	\$14.11	\$4.52	\$8.89
72	\$13.49	\$4.00	\$8.45	\$12.98	\$4.00	\$7.84	\$14.32	\$4.00	\$8.70
73	\$14.03	\$4.00	\$8.20	\$13.83	\$4.00	\$8.57	\$13.32	\$4.00	\$10.18
74	\$13.15	\$4.00	\$7.66	\$11.07	\$4.00	\$8.64	\$14.19	\$4.00	\$7.58
75	\$9.93	\$4.00	\$6.82	\$13.78	\$4.00	\$7.95	\$12.12	\$4.00	\$8.26
76	\$13.31	\$4.00	\$7.98	\$12.43	\$4.00	\$8.72	\$13.51	\$4.00	\$7.87
77	\$14.23	\$4.00	\$8.04	\$15.44	\$4.00	\$9.43	\$15.00	\$4.00	\$8.55
78	\$11.60	\$4.00	\$8.63	\$13.98	\$4.00	\$8.15	\$14.26	\$4.00	\$9.30
79	\$12.89	\$4.00	\$7.73	\$12.97	\$4.00	\$8.14	\$16.05	\$4.00	\$9.69
80	\$11.92	\$4.00	\$7.43	\$14.81	\$5.79	\$8.99	\$13.02	\$4.00	\$7.67
81	\$10.32	\$4.00	\$6.59	\$13.78	\$4.00	\$9.37	\$9.97	\$5.57	\$7.91
82	\$15.03	\$4.00	\$8.86	\$13.64	\$4.00	\$8.16	\$10.13	\$4.00	\$6.71
83	\$13.46	\$4.97	\$8.15	\$14.36	\$4.00	\$8.52	\$13.71	\$4.00	\$8.24
84	\$13.19	\$4.00	\$8.29	\$14.12	\$4.00	\$8.28	\$13.44	\$4.00	\$8.41
85	\$11.82	\$4.25	\$8.35	\$14.95	\$4.00	\$9.86	\$15.85	\$4.00	\$7.92
86	\$14.42	\$4.00	\$7.84	\$14.81	\$4.00	\$7.86	\$14.48	\$4.00	\$8.75
87	\$14.08	\$4.00	\$7.67	\$13.20	\$4.00	\$7.45	\$12.75	\$4.00	\$7.55
88	\$14.42	\$4.00	\$8.15	\$14.40	\$4.00	\$8.98	\$14.35	\$4.96	\$10.23
89	\$13.55	\$4.00	\$8.54	\$14.40	\$5.10	\$9.69	\$15.62	\$4.16	\$10.58
90	\$13.49	\$4.00	\$9.27	\$13.88	\$4.00	\$7.90	\$13.40	\$4.00	\$8.23
91	\$11.67	\$5.10	\$7.89	\$15.44	\$4.00	\$8.28	\$14.26	\$4.00	\$8.85
92	\$11.90	\$5.61	\$8.01	\$13.75	\$4.00	\$8.69	\$14.34	\$4.00	\$9.22
93	\$12.20	\$4.00	\$7.48	\$13.78	\$4.00	\$8.37	\$15.47	\$4.07	\$10.62
94	\$13.71	\$4.00	\$7.95	\$13.78	\$4.00	\$9.58	\$15.00	\$4.00	\$7.96
95	\$12.71	\$4.00	\$8.93	\$13.80	\$6.02	\$10.00	\$14.32	\$4.00	\$7.11
96	\$14.42	\$4.00	\$9.07	\$11.64	\$4.00	\$7.29	\$15.42	\$4.00	\$8.76
97	\$13.31	\$4.00	\$7.18	\$12.76	\$4.00	\$8.37	\$12.37	\$4.00	\$8.06
98	\$14.40	\$4.00	\$7.74	\$14.50	\$4.13	\$8.78	\$14.04	\$4.00	\$8.07
99	\$14.42	\$4.19	\$9.24	\$10.63	\$4.00	\$6.82	\$15.49	\$4.00	\$9.76
100	\$14.27	\$4.00	\$7.49	\$11.52	\$4.00	\$7.23	\$14.41	\$4.00	\$9.37
101	\$13.55	\$4.00	\$8.65	\$13.64	\$4.00	\$7.45	\$14.38	\$4.00	\$9.47
102	\$13.34	\$4.00	\$9.20	\$13.32	\$4.00	\$8.28	\$16.05	\$4.00	\$8.68
103	\$13.55	\$4.00	\$8.73	\$12.31	\$4.00	\$7.41	\$14.13	\$4.00	\$7.96
104	\$12.82	\$4.00	\$7.35	\$12.39	\$4.00	\$8.01	\$14.48	\$4.00	\$8.81

Nymex Detail-Annual Ranges

Draw	2015			2016			2017		
	max	min	avg	max	min	avg	max	min	avg
1	\$14.42	\$4.00	\$9.01	\$14.46	\$4.00	\$9.66	\$14.26	\$4.00	\$7.62
2	\$13.55	\$4.00	\$7.48	\$14.81	\$4.00	\$9.22	\$11.00	\$4.00	\$7.92
3	\$14.03	\$4.00	\$7.98	\$13.70	\$4.00	\$7.47	\$11.83	\$4.00	\$7.50
4	\$13.54	\$4.00	\$9.71	\$13.98	\$4.00	\$8.52	\$13.68	\$4.00	\$8.18
5	\$14.70	\$4.00	\$8.79	\$14.81	\$4.00	\$8.12	\$11.21	\$4.00	\$7.83
6	\$13.49	\$4.00	\$9.79	\$11.73	\$4.00	\$7.57	\$11.31	\$4.00	\$6.95
7	\$14.12	\$4.45	\$8.60	\$14.81	\$4.00	\$9.01	\$12.07	\$4.85	\$8.01
8	\$14.42	\$4.00	\$8.98	\$13.66	\$4.00	\$8.95	\$14.67	\$4.22	\$10.35
9	\$13.49	\$4.00	\$8.48	\$13.83	\$4.00	\$7.73	\$13.06	\$4.00	\$7.97
10	\$14.42	\$4.00	\$9.31	\$12.92	\$4.00	\$9.76	\$15.65	\$4.00	\$7.93
11	\$12.56	\$4.00	\$7.85	\$15.09	\$4.00	\$8.54	\$11.86	\$4.00	\$7.00
12	\$10.98	\$4.00	\$6.95	\$13.83	\$4.00	\$8.72	\$12.61	\$4.07	\$6.93
13	\$13.31	\$4.00	\$7.81	\$13.11	\$4.00	\$8.65	\$15.79	\$4.25	\$9.65
14	\$14.31	\$4.00	\$8.15	\$13.19	\$4.00	\$8.79	\$14.26	\$5.18	\$10.45
15	\$15.03	\$4.00	\$9.37	\$11.78	\$4.00	\$7.15	\$15.18	\$4.00	\$8.09
16	\$13.20	\$4.00	\$9.52	\$13.10	\$4.00	\$8.06	\$11.33	\$4.00	\$6.21
17	\$13.49	\$4.00	\$8.59	\$12.68	\$4.00	\$7.78	\$14.67	\$4.00	\$9.28
18	\$13.25	\$4.00	\$8.52	\$11.11	\$4.00	\$7.30	\$16.05	\$4.00	\$9.24
19	\$14.51	\$4.00	\$8.76	\$13.78	\$4.00	\$9.04	\$15.00	\$4.94	\$8.85
20	\$10.32	\$4.00	\$7.79	\$14.56	\$4.00	\$7.65	\$11.57	\$4.00	\$7.54
21	\$13.11	\$4.00	\$7.90	\$13.96	\$5.13	\$8.82	\$14.32	\$4.00	\$8.08
22	\$15.03	\$4.00	\$7.20	\$13.69	\$4.00	\$8.07	\$14.48	\$4.52	\$8.80
23	\$13.55	\$4.00	\$8.49	\$13.78	\$4.00	\$7.97	\$14.11	\$5.07	\$9.40
24	\$13.63	\$4.00	\$9.55	\$13.83	\$4.83	\$9.03	\$15.00	\$4.00	\$9.30
25	\$13.71	\$4.00	\$8.26	\$13.70	\$4.61	\$8.43	\$14.26	\$4.00	\$9.23
26	\$13.55	\$4.00	\$9.65	\$12.30	\$4.00	\$7.69	\$10.54	\$4.00	\$7.26
27	\$15.03	\$4.00	\$7.71	\$13.89	\$4.00	\$8.13	\$14.48	\$4.00	\$7.93
28	\$14.03	\$4.00	\$7.86	\$14.58	\$4.00	\$8.63	\$12.23	\$4.00	\$7.05
29	\$11.27	\$4.00	\$6.98	\$15.20	\$4.00	\$9.19	\$12.92	\$4.78	\$9.05
30	\$12.71	\$4.00	\$7.84	\$15.44	\$4.00	\$9.35	\$15.00	\$4.98	\$8.39
31	\$11.99	\$4.00	\$8.05	\$13.89	\$4.00	\$8.86	\$13.40	\$4.00	\$7.46
32	\$14.34	\$5.34	\$9.00	\$10.53	\$4.00	\$7.29	\$13.86	\$4.00	\$8.77
33	\$10.88	\$4.00	\$7.18	\$13.83	\$4.00	\$8.44	\$14.26	\$4.00	\$9.48
34	\$14.18	\$4.00	\$8.74	\$15.44	\$4.00	\$9.00	\$16.05	\$4.36	\$9.32
35	\$15.03	\$4.00	\$8.45	\$12.95	\$4.00	\$6.45	\$10.42	\$4.00	\$7.59
36	\$13.31	\$4.00	\$6.94	\$11.09	\$4.00	\$7.67	\$14.19	\$4.00	\$7.82
37	\$11.33	\$4.00	\$7.94	\$14.40	\$4.00	\$8.93	\$12.90	\$4.00	\$8.45
38	\$13.55	\$4.00	\$8.78	\$14.40	\$4.00	\$8.06	\$13.94	\$4.00	\$8.93
39	\$13.44	\$4.00	\$7.75	\$15.44	\$4.00	\$9.87	\$14.48	\$4.00	\$8.09
40	\$14.79	\$4.00	\$7.75	\$14.81	\$4.29	\$9.30	\$14.48	\$4.00	\$8.34
41	\$13.44	\$4.00	\$8.50	\$14.12	\$4.00	\$8.78	\$12.34	\$4.00	\$8.20
42	\$10.98	\$4.00	\$7.03	\$15.44	\$4.00	\$8.54	\$16.05	\$4.00	\$9.50
43	\$15.03	\$4.00	\$9.70	\$14.15	\$4.00	\$8.91	\$10.93	\$4.00	\$6.96
44	\$13.31	\$4.00	\$8.05	\$10.79	\$4.00	\$6.84	\$14.26	\$4.00	\$6.32
45	\$13.60	\$4.32	\$8.89	\$13.98	\$4.00	\$7.66	\$13.72	\$4.00	\$9.41
46	\$13.63	\$4.00	\$7.42	\$15.44	\$4.00	\$9.76	\$14.26	\$4.00	\$7.86
47	\$13.63	\$4.00	\$8.45	\$13.89	\$4.10	\$7.74	\$14.26	\$4.00	\$7.79
48	\$13.15	\$4.00	\$8.33	\$12.19	\$4.00	\$8.54	\$15.00	\$4.00	\$7.59
49	\$14.11	\$4.00	\$9.16	\$11.16	\$4.00	\$7.13	\$12.81	\$5.95	\$8.92
50	\$14.42	\$4.00	\$8.84	\$14.01	\$4.00	\$8.73	\$14.31	\$4.60	\$9.33
51	\$13.81	\$4.01	\$8.61	\$11.25	\$4.00	\$7.67	\$15.63	\$4.04	\$9.35
52	\$14.03	\$4.00	\$8.72	\$13.78	\$4.00	\$8.42	\$16.05	\$5.58	\$10.90

Nymex Detail-Annual Ranges

Draw	2015			2016			2017		
	max	min	avg	max	min	avg	max	min	avg
105	\$14.79	\$4.00	\$9.16	\$13.83	\$5.93	\$10.01	\$14.38	\$4.00	\$7.90
106	\$9.60	\$4.00	\$6.14	\$15.44	\$4.00	\$7.85	\$14.32	\$4.00	\$9.44
107	\$13.63	\$4.00	\$8.71	\$13.65	\$4.00	\$8.74	\$15.74	\$4.84	\$9.68
108	\$13.55	\$4.00	\$6.96	\$11.30	\$4.00	\$6.76	\$13.27	\$4.00	\$8.60
109	\$13.44	\$4.00	\$9.51	\$12.39	\$4.00	\$7.54	\$16.05	\$4.51	\$9.84
110	\$13.01	\$4.00	\$7.03	\$13.29	\$4.00	\$8.38	\$14.93	\$4.00	\$8.28
111	\$13.34	\$4.00	\$8.97	\$13.03	\$4.00	\$8.36	\$14.15	\$4.00	\$9.90
112	\$13.63	\$4.00	\$7.74	\$12.74	\$4.00	\$9.36	\$15.00	\$4.00	\$8.14
113	\$12.68	\$4.00	\$7.54	\$12.75	\$4.00	\$8.89	\$14.83	\$4.00	\$8.60
114	\$13.21	\$4.00	\$7.69	\$15.44	\$4.00	\$9.21	\$13.44	\$4.00	\$8.94
115	\$14.03	\$4.00	\$9.18	\$13.28	\$4.62	\$8.48	\$15.49	\$4.11	\$9.86
116	\$13.55	\$4.00	\$9.98	\$13.98	\$4.00	\$7.14	\$14.18	\$4.00	\$8.88
117	\$13.49	\$4.00	\$8.75	\$14.14	\$4.00	\$9.27	\$13.41	\$4.23	\$9.52
118	\$15.03	\$4.00	\$8.28	\$13.89	\$4.00	\$9.45	\$14.16	\$4.00	\$9.73
119	\$15.03	\$4.00	\$8.10	\$15.44	\$4.00	\$8.85	\$13.26	\$4.00	\$8.07
120	\$13.10	\$4.00	\$7.67	\$13.98	\$4.00	\$8.58	\$14.93	\$4.00	\$10.19
121	\$14.79	\$6.19	\$11.37	\$15.44	\$4.00	\$8.71	\$14.32	\$5.54	\$10.69
122	\$15.03	\$4.00	\$8.40	\$13.55	\$4.00	\$8.00	\$15.12	\$4.00	\$9.45
123	\$11.67	\$4.00	\$6.62	\$12.03	\$4.00	\$8.51	\$14.48	\$4.00	\$8.06
124	\$12.09	\$4.00	\$6.53	\$13.70	\$4.00	\$9.26	\$14.17	\$4.00	\$8.32
125	\$15.03	\$4.00	\$8.74	\$13.89	\$4.00	\$8.20	\$14.57	\$4.62	\$9.57
126	\$13.38	\$4.00	\$6.83	\$15.03	\$4.00	\$7.95	\$14.93	\$4.00	\$8.71
127	\$13.16	\$4.00	\$7.38	\$13.70	\$4.00	\$7.85	\$13.11	\$4.00	\$7.56
128	\$13.44	\$4.00	\$6.57	\$14.40	\$4.00	\$9.16	\$11.49	\$5.84	\$8.23
129	\$13.31	\$4.00	\$6.97	\$11.65	\$4.00	\$7.84	\$16.05	\$4.00	\$9.36
130	\$13.44	\$4.00	\$8.74	\$14.39	\$4.00	\$9.42	\$14.93	\$4.00	\$7.60
131	\$13.48	\$4.00	\$8.06	\$12.72	\$4.00	\$6.75	\$12.19	\$4.00	\$7.81
132	\$11.39	\$4.00	\$7.07	\$13.83	\$5.44	\$8.58	\$12.59	\$4.00	\$8.78
133	\$13.36	\$4.00	\$7.08	\$11.79	\$4.48	\$8.26	\$12.01	\$4.00	\$6.93
134	\$14.19	\$4.00	\$8.97	\$13.64	\$4.00	\$9.35	\$12.64	\$4.00	\$7.11
135	\$14.03	\$4.00	\$8.24	\$13.38	\$4.00	\$7.90	\$11.60	\$4.00	\$7.61
136	\$11.66	\$4.00	\$6.87	\$13.78	\$4.00	\$7.36	\$14.48	\$4.00	\$8.30
137	\$14.21	\$4.00	\$8.62	\$13.78	\$5.39	\$9.23	\$15.67	\$4.00	\$8.52
138	\$12.36	\$4.00	\$7.31	\$14.40	\$4.00	\$8.76	\$15.00	\$4.00	\$8.78
139	\$10.18	\$4.00	\$6.04	\$14.81	\$4.00	\$9.12	\$16.05	\$4.00	\$9.06
140	\$14.34	\$4.00	\$8.87	\$13.89	\$5.01	\$9.22	\$14.26	\$4.00	\$7.91
141	\$15.03	\$4.00	\$8.66	\$13.23	\$4.00	\$8.40	\$13.61	\$4.00	\$6.58
142	\$15.03	\$4.00	\$8.64	\$10.12	\$4.00	\$6.18	\$13.67	\$4.56	\$8.29
143	\$10.44	\$4.00	\$5.85	\$13.20	\$4.00	\$8.11	\$10.71	\$4.00	\$6.88
144	\$13.70	\$4.00	\$8.89	\$13.26	\$4.00	\$6.47	\$12.24	\$4.00	\$7.52
145	\$11.48	\$4.00	\$8.73	\$12.48	\$4.00	\$6.35	\$14.26	\$4.00	\$8.09
146	\$11.54	\$4.00	\$6.45	\$13.78	\$4.00	\$8.76	\$14.35	\$4.00	\$7.28
147	\$11.25	\$4.71	\$7.25	\$14.46	\$4.00	\$9.93	\$16.05	\$4.00	\$7.43
148	\$15.03	\$4.00	\$8.07	\$13.40	\$4.00	\$9.10	\$14.23	\$4.39	\$8.34
149	\$13.44	\$4.00	\$8.58	\$14.04	\$4.00	\$9.19	\$14.26	\$4.00	\$8.42
150	\$13.93	\$4.00	\$8.59	\$13.83	\$4.00	\$8.31	\$13.94	\$4.34	\$9.21
151	\$15.03	\$4.00	\$8.45	\$12.34	\$4.77	\$7.41	\$14.19	\$4.00	\$8.53
152	\$13.37	\$4.00	\$7.42	\$14.81	\$4.00	\$10.00	\$12.10	\$4.00	\$7.25
153	\$15.03	\$4.00	\$8.70	\$15.30	\$4.00	\$10.10	\$14.48	\$4.00	\$8.37
154	\$13.31	\$4.00	\$8.56	\$13.45	\$6.54	\$8.57	\$13.27	\$4.00	\$8.26
155	\$13.63	\$4.00	\$8.80	\$13.70	\$4.00	\$8.53	\$13.85	\$4.00	\$7.78
156	\$15.03	\$4.00	\$7.83	\$13.78	\$4.72	\$9.80	\$13.89	\$5.46	\$9.86

Nymex Detail-Annual Ranges

Draw	2015			2016			2017		
	max	min	avg	max	min	avg	max	min	avg
157	\$13.22	\$4.00	\$6.89	\$13.23	\$4.00	\$6.82	\$14.16	\$4.00	\$8.48
158	\$13.84	\$4.00	\$7.70	\$15.44	\$4.00	\$7.58	\$14.19	\$4.00	\$8.11
159	\$13.40	\$4.00	\$9.77	\$14.81	\$4.00	\$8.64	\$15.15	\$5.47	\$9.81
160	\$11.11	\$4.00	\$5.91	\$13.89	\$4.00	\$8.25	\$15.00	\$4.00	\$8.60
161	\$13.55	\$4.00	\$9.52	\$15.44	\$4.00	\$9.07	\$12.84	\$4.00	\$7.92
162	\$13.71	\$4.00	\$7.50	\$13.95	\$5.78	\$10.56	\$12.01	\$4.00	\$6.97
163	\$13.56	\$4.00	\$8.21	\$13.78	\$4.00	\$8.49	\$14.11	\$4.00	\$9.79
164	\$12.55	\$4.00	\$8.58	\$10.96	\$4.00	\$6.58	\$11.35	\$4.00	\$6.73
165	\$13.55	\$4.00	\$8.93	\$15.11	\$4.00	\$7.68	\$14.04	\$4.00	\$7.62
166	\$13.43	\$4.00	\$8.67	\$13.83	\$4.00	\$8.86	\$12.71	\$4.00	\$8.39
167	\$15.03	\$4.00	\$8.93	\$13.78	\$4.00	\$7.79	\$14.10	\$5.45	\$9.51
168	\$13.82	\$4.00	\$8.23	\$14.32	\$4.00	\$7.42	\$14.93	\$4.00	\$10.06
169	\$13.24	\$4.00	\$8.19	\$13.78	\$4.00	\$7.11	\$14.11	\$4.00	\$8.47
170	\$14.18	\$4.00	\$8.54	\$13.83	\$4.00	\$8.48	\$14.37	\$6.00	\$9.29
171	\$13.44	\$4.00	\$8.24	\$13.78	\$4.00	\$7.07	\$11.02	\$4.00	\$7.53
172	\$13.44	\$4.00	\$8.81	\$14.40	\$4.00	\$9.12	\$13.25	\$4.00	\$7.53
173	\$11.42	\$4.00	\$6.99	\$14.98	\$5.98	\$9.93	\$13.69	\$4.00	\$7.71
174	\$13.22	\$4.00	\$8.53	\$14.81	\$4.00	\$8.69	\$14.47	\$5.52	\$9.88
175	\$13.44	\$4.00	\$7.86	\$11.03	\$4.00	\$7.53	\$15.00	\$4.00	\$9.24
176	\$13.93	\$4.17	\$9.29	\$13.78	\$4.00	\$7.27	\$11.43	\$4.00	\$7.85
177	\$11.42	\$4.00	\$7.37	\$14.03	\$4.00	\$7.43	\$13.33	\$4.67	\$9.22
178	\$13.02	\$5.78	\$8.52	\$13.89	\$4.00	\$8.61	\$13.38	\$4.00	\$8.31
179	\$13.49	\$4.00	\$8.97	\$11.65	\$4.00	\$7.61	\$13.85	\$4.00	\$7.91
180	\$14.79	\$4.00	\$10.33	\$13.89	\$4.00	\$8.80	\$11.11	\$4.00	\$7.31
181	\$14.79	\$5.37	\$10.10	\$9.89	\$4.27	\$7.50	\$14.36	\$4.00	\$9.88
182	\$15.03	\$4.00	\$10.06	\$13.98	\$4.00	\$7.64	\$16.05	\$4.00	\$7.88
183	\$12.29	\$4.00	\$8.32	\$13.89	\$4.00	\$8.73	\$15.00	\$4.00	\$8.83
184	\$13.55	\$4.00	\$8.90	\$15.44	\$4.00	\$9.80	\$11.14	\$4.00	\$8.42
185	\$15.03	\$4.00	\$8.58	\$14.81	\$4.00	\$9.37	\$14.38	\$4.00	\$9.56
186	\$13.37	\$4.00	\$9.00	\$13.19	\$4.00	\$7.61	\$15.00	\$4.00	\$7.32
187	\$13.91	\$4.00	\$9.38	\$15.37	\$4.00	\$8.77	\$15.23	\$4.00	\$9.95
188	\$15.03	\$4.00	\$9.02	\$10.50	\$4.00	\$7.55	\$12.08	\$4.00	\$7.13
189	\$13.38	\$4.00	\$7.57	\$15.44	\$6.45	\$10.81	\$15.00	\$6.10	\$9.82
190	\$13.55	\$4.00	\$10.25	\$13.64	\$4.00	\$8.44	\$12.41	\$4.00	\$9.00
191	\$15.03	\$4.00	\$8.96	\$15.44	\$4.00	\$9.38	\$16.05	\$4.00	\$7.88
192	\$9.11	\$4.00	\$5.41	\$13.78	\$4.00	\$8.10	\$13.30	\$4.00	\$7.87
193	\$13.58	\$4.00	\$8.72	\$11.55	\$4.00	\$7.05	\$14.99	\$4.00	\$9.16
194	\$12.74	\$4.64	\$9.04	\$13.02	\$5.64	\$9.18	\$13.77	\$4.00	\$7.45
195	\$10.97	\$4.00	\$7.60	\$14.81	\$4.00	\$9.67	\$13.57	\$4.00	\$8.37
196	\$15.03	\$4.00	\$8.50	\$13.22	\$4.00	\$9.43	\$15.79	\$4.00	\$9.27
197	\$14.47	\$4.00	\$8.76	\$13.70	\$4.00	\$8.78	\$15.00	\$4.53	\$9.63
198	\$15.03	\$4.00	\$8.99	\$14.04	\$4.00	\$8.55	\$15.00	\$4.00	\$8.87
199	\$11.97	\$5.10	\$7.88	\$13.41	\$4.00	\$7.51	\$12.83	\$4.00	\$8.50
200	\$11.34	\$4.00	\$7.00	\$13.89	\$4.00	\$9.17	\$13.17	\$4.00	\$9.23
average	\$13.43	\$4.09	\$8.26	\$13.67	\$4.15	\$8.42	\$13.91	\$4.17	\$8.47
Max	\$15.03			\$15.44			\$16.05		
Avg			\$8.26			\$8.42			\$8.47
Min	\$4.00			\$4.00			\$4.00		
Range	11.03			11.44			12.05		

Nymex Detail-Annual Ranges

Draw	2018			2019			2020		
	max	min	avg	max	min	avg	max	min	avg
1	\$14.08	\$4.00	\$8.90	\$11.69	\$4.00	\$7.25	\$16.24	\$4.00	\$9.79
2	\$13.51	\$4.00	\$7.92	\$15.00	\$4.00	\$9.39	\$14.92	\$5.39	\$10.51
3	\$14.81	\$4.93	\$8.39	\$14.54	\$4.00	\$9.16	\$11.48	\$4.16	\$8.24
4	\$15.24	\$4.00	\$8.65	\$15.99	\$4.00	\$9.76	\$15.00	\$4.00	\$9.09
5	\$15.00	\$5.19	\$9.95	\$16.40	\$4.70	\$9.14	\$13.90	\$4.00	\$8.91
6	\$14.44	\$4.00	\$9.76	\$14.89	\$4.00	\$10.37	\$12.58	\$4.00	\$8.93
7	\$14.60	\$4.00	\$8.26	\$14.62	\$4.00	\$6.65	\$11.30	\$4.00	\$7.73
8	\$11.56	\$4.00	\$6.70	\$14.77	\$4.77	\$10.30	\$15.00	\$4.00	\$7.36
9	\$15.00	\$4.07	\$9.93	\$13.94	\$4.00	\$7.70	\$13.90	\$4.00	\$8.90
10	\$14.38	\$5.83	\$10.51	\$15.00	\$4.00	\$8.48	\$12.02	\$4.00	\$8.36
11	\$14.44	\$6.22	\$9.63	\$14.39	\$4.00	\$8.73	\$15.00	\$4.00	\$9.97
12	\$14.38	\$4.00	\$8.09	\$14.77	\$4.00	\$9.93	\$16.78	\$4.00	\$9.94
13	\$10.79	\$4.00	\$7.24	\$14.54	\$4.00	\$8.25	\$15.00	\$4.00	\$8.32
14	\$14.66	\$4.00	\$8.92	\$15.00	\$4.00	\$7.98	\$15.00	\$5.59	\$9.44
15	\$12.21	\$4.00	\$6.90	\$14.43	\$4.00	\$9.71	\$14.76	\$4.00	\$6.68
16	\$12.61	\$4.00	\$7.99	\$14.16	\$4.00	\$7.84	\$15.00	\$4.00	\$10.55
17	\$14.38	\$4.00	\$7.07	\$15.00	\$4.00	\$8.71	\$14.92	\$4.00	\$7.84
18	\$14.30	\$4.00	\$7.99	\$10.90	\$4.00	\$6.90	\$13.44	\$4.00	\$8.29
19	\$13.24	\$4.00	\$7.66	\$13.37	\$4.00	\$8.30	\$13.52	\$4.47	\$7.88
20	\$12.93	\$4.16	\$8.56	\$16.40	\$4.00	\$10.20	\$13.52	\$4.00	\$6.67
21	\$12.88	\$4.00	\$7.54	\$16.13	\$4.00	\$10.14	\$14.76	\$4.00	\$8.44
22	\$13.71	\$4.00	\$8.36	\$14.46	\$4.00	\$8.50	\$14.39	\$4.00	\$9.60
23	\$15.17	\$4.00	\$10.81	\$13.88	\$4.00	\$8.02	\$12.67	\$4.00	\$7.83
24	\$12.87	\$4.56	\$8.24	\$14.30	\$4.00	\$7.32	\$14.21	\$4.00	\$8.85
25	\$14.53	\$4.00	\$9.57	\$15.73	\$4.00	\$9.01	\$15.00	\$4.00	\$10.76
26	\$13.74	\$5.03	\$9.76	\$14.96	\$4.00	\$8.32	\$15.00	\$6.04	\$9.51
27	\$15.00	\$4.00	\$9.36	\$14.54	\$4.00	\$7.44	\$15.46	\$4.00	\$9.97
28	\$14.94	\$4.00	\$9.10	\$14.49	\$4.00	\$10.70	\$12.26	\$4.00	\$7.35
29	\$14.23	\$4.00	\$9.29	\$14.56	\$4.00	\$7.90	\$13.59	\$4.00	\$8.27
30	\$13.00	\$5.95	\$9.63	\$14.67	\$7.44	\$10.98	\$15.00	\$4.00	\$9.73
31	\$14.38	\$4.00	\$8.08	\$14.54	\$4.00	\$7.46	\$13.84	\$4.00	\$8.81
32	\$14.50	\$4.62	\$9.81	\$14.77	\$4.00	\$8.42	\$14.06	\$5.20	\$9.12
33	\$14.32	\$4.00	\$8.41	\$14.54	\$4.00	\$9.06	\$15.00	\$4.00	\$7.94
34	\$14.46	\$4.00	\$8.86	\$14.54	\$4.00	\$8.81	\$14.99	\$4.00	\$8.31
35	\$16.20	\$4.00	\$7.92	\$11.07	\$4.00	\$6.83	\$13.45	\$4.00	\$9.32
36	\$14.60	\$4.00	\$8.31	\$15.33	\$4.00	\$7.88	\$14.92	\$4.00	\$8.40
37	\$13.78	\$4.00	\$9.41	\$12.69	\$4.00	\$7.95	\$12.57	\$5.85	\$9.26
38	\$14.92	\$4.00	\$9.63	\$14.46	\$4.00	\$7.38	\$15.70	\$4.00	\$8.05
39	\$14.21	\$4.00	\$7.26	\$13.32	\$4.00	\$7.15	\$14.92	\$4.00	\$9.34
40	\$14.93	\$4.00	\$9.85	\$15.00	\$4.00	\$8.41	\$16.87	\$4.00	\$9.86
41	\$11.06	\$4.26	\$8.22	\$15.00	\$4.00	\$7.87	\$14.99	\$4.00	\$9.82
42	\$13.99	\$4.00	\$7.31	\$13.11	\$6.55	\$10.76	\$12.42	\$4.00	\$8.42
43	\$15.38	\$4.00	\$6.83	\$13.11	\$4.00	\$9.94	\$15.00	\$4.00	\$8.01
44	\$14.60	\$4.04	\$9.98	\$14.31	\$4.00	\$8.46	\$13.79	\$4.00	\$6.18
45	\$14.38	\$4.00	\$7.89	\$12.50	\$4.00	\$7.34	\$14.04	\$5.15	\$10.79
46	\$16.20	\$4.00	\$10.57	\$15.00	\$4.00	\$8.87	\$13.79	\$4.00	\$9.57
47	\$13.73	\$4.00	\$8.15	\$14.54	\$5.22	\$8.73	\$13.58	\$4.00	\$8.84
48	\$14.44	\$7.32	\$10.69	\$14.52	\$4.00	\$7.56	\$14.34	\$4.65	\$8.17
49	\$14.38	\$4.00	\$9.74	\$14.20	\$4.00	\$9.72	\$11.59	\$4.00	\$7.74
50	\$14.58	\$4.00	\$7.72	\$11.19	\$4.00	\$7.20	\$13.13	\$4.00	\$8.46
51	\$12.42	\$4.00	\$6.82	\$14.32	\$4.00	\$7.67	\$15.00	\$4.00	\$9.01
52	\$10.99	\$4.00	\$5.88	\$13.95	\$4.00	\$7.88	\$15.00	\$4.00	\$9.01

Nymex Detail-Annual Ranges

Draw	2018			2019			2020		
	max	min	avg	max	min	avg	max	min	avg
53	\$14.44	\$5.28	\$9.09	\$15.00	\$4.00	\$8.65	\$11.75	\$4.00	\$8.26
54	\$14.38	\$4.00	\$7.45	\$14.54	\$4.00	\$7.33	\$13.80	\$4.00	\$7.32
55	\$13.67	\$4.00	\$6.89	\$14.67	\$4.00	\$8.82	\$12.86	\$4.00	\$8.50
56	\$10.23	\$4.00	\$6.71	\$16.13	\$4.00	\$9.41	\$15.00	\$4.56	\$9.41
57	\$15.00	\$4.00	\$9.91	\$14.67	\$4.00	\$7.92	\$15.00	\$4.00	\$9.67
58	\$13.66	\$4.00	\$8.25	\$14.54	\$4.00	\$8.61	\$14.99	\$4.00	\$7.73
59	\$14.00	\$4.00	\$9.25	\$11.82	\$4.00	\$7.63	\$14.76	\$6.06	\$9.78
60	\$14.38	\$4.00	\$8.16	\$14.68	\$4.00	\$8.48	\$15.69	\$6.06	\$9.22
61	\$13.40	\$4.00	\$6.81	\$16.40	\$4.00	\$9.48	\$15.00	\$4.36	\$9.09
62	\$11.72	\$4.00	\$7.70	\$15.33	\$4.00	\$10.96	\$14.99	\$4.00	\$8.75
63	\$13.08	\$4.00	\$7.66	\$14.83	\$4.00	\$8.60	\$16.59	\$4.00	\$9.54
64	\$14.60	\$4.00	\$9.69	\$15.04	\$4.00	\$8.43	\$13.90	\$4.46	\$8.54
65	\$13.51	\$5.80	\$8.65	\$14.54	\$4.00	\$7.11	\$13.71	\$4.00	\$8.46
66	\$15.93	\$4.00	\$10.27	\$14.77	\$4.00	\$8.77	\$15.00	\$4.00	\$10.59
67	\$12.69	\$4.00	\$8.88	\$15.00	\$4.00	\$8.23	\$14.40	\$4.93	\$9.16
68	\$12.69	\$4.00	\$8.35	\$14.46	\$4.00	\$7.44	\$15.00	\$4.00	\$9.03
69	\$14.68	\$5.49	\$9.72	\$16.12	\$4.00	\$10.73	\$13.08	\$4.00	\$9.06
70	\$14.29	\$4.00	\$8.66	\$15.00	\$4.00	\$8.38	\$15.00	\$4.73	\$8.64
71	\$14.44	\$4.94	\$10.67	\$12.11	\$4.00	\$7.11	\$13.29	\$4.00	\$7.38
72	\$15.00	\$4.00	\$8.90	\$16.40	\$4.00	\$9.22	\$14.76	\$4.00	\$7.26
73	\$12.55	\$4.00	\$8.47	\$14.56	\$4.00	\$9.23	\$15.00	\$4.00	\$10.78
74	\$13.83	\$4.00	\$8.29	\$14.18	\$4.00	\$7.31	\$16.87	\$4.00	\$7.08
75	\$16.20	\$4.00	\$8.39	\$12.39	\$4.00	\$8.47	\$12.98	\$4.20	\$8.36
76	\$12.94	\$4.37	\$9.28	\$13.44	\$4.59	\$9.17	\$12.63	\$4.00	\$7.85
77	\$13.49	\$4.00	\$7.73	\$12.99	\$4.00	\$7.69	\$13.07	\$4.00	\$7.77
78	\$14.44	\$4.00	\$7.36	\$15.30	\$4.00	\$8.58	\$14.99	\$4.00	\$9.90
79	\$13.67	\$4.11	\$9.03	\$14.39	\$4.00	\$10.20	\$15.00	\$4.00	\$9.17
80	\$13.66	\$4.51	\$9.68	\$14.46	\$4.00	\$10.22	\$13.19	\$4.00	\$8.74
81	\$13.79	\$4.00	\$8.10	\$14.67	\$4.00	\$8.15	\$15.00	\$4.00	\$9.10
82	\$14.38	\$4.00	\$8.68	\$14.67	\$4.00	\$8.51	\$15.00	\$6.48	\$10.35
83	\$14.38	\$4.00	\$10.05	\$15.04	\$4.00	\$9.77	\$16.59	\$4.40	\$9.80
84	\$14.50	\$4.00	\$8.62	\$16.13	\$4.00	\$9.00	\$15.00	\$4.00	\$8.43
85	\$12.05	\$4.00	\$8.57	\$15.00	\$4.00	\$7.10	\$15.39	\$4.00	\$8.71
86	\$16.20	\$7.96	\$10.82	\$11.25	\$4.00	\$6.74	\$15.64	\$4.00	\$7.76
87	\$15.00	\$4.00	\$8.81	\$13.56	\$4.00	\$9.07	\$14.79	\$4.00	\$8.46
88	\$14.60	\$4.00	\$8.71	\$11.46	\$4.00	\$8.66	\$14.76	\$4.00	\$9.30
89	\$14.44	\$4.00	\$8.91	\$14.46	\$4.26	\$8.70	\$16.87	\$4.00	\$8.38
90	\$14.23	\$4.00	\$7.90	\$11.39	\$4.00	\$7.37	\$14.41	\$4.00	\$8.16
91	\$14.62	\$4.00	\$8.76	\$14.58	\$4.00	\$10.75	\$16.87	\$4.00	\$9.44
92	\$16.20	\$4.00	\$9.44	\$16.13	\$4.35	\$9.98	\$14.92	\$4.00	\$7.84
93	\$15.00	\$4.00	\$9.78	\$16.40	\$4.00	\$9.96	\$14.81	\$4.29	\$9.08
94	\$14.29	\$4.00	\$6.65	\$15.00	\$4.00	\$9.88	\$13.76	\$5.24	\$10.42
95	\$13.56	\$4.00	\$7.80	\$14.67	\$4.00	\$6.43	\$14.13	\$4.00	\$7.74
96	\$15.00	\$4.00	\$9.66	\$15.88	\$4.88	\$10.07	\$13.34	\$5.96	\$9.42
97	\$14.79	\$5.28	\$9.79	\$15.08	\$4.00	\$9.37	\$14.99	\$4.00	\$10.02
98	\$12.89	\$4.00	\$8.23	\$13.49	\$4.58	\$8.55	\$14.99	\$4.00	\$8.75
99	\$15.81	\$6.03	\$10.47	\$16.13	\$5.49	\$11.50	\$14.99	\$6.65	\$9.69
100	\$15.72	\$4.00	\$8.74	\$13.83	\$4.00	\$9.22	\$13.05	\$4.00	\$8.39
101	\$14.11	\$4.00	\$7.03	\$16.13	\$4.24	\$9.91	\$14.92	\$4.00	\$10.31
102	\$15.93	\$4.00	\$9.20	\$14.77	\$4.00	\$9.39	\$14.35	\$5.70	\$9.56
103	\$12.86	\$5.38	\$8.35	\$13.23	\$4.00	\$8.20	\$15.11	\$4.00	\$8.78
104	\$13.82	\$4.00	\$7.13	\$12.42	\$4.00	\$8.32	\$14.92	\$4.00	\$8.04

Nymex Detail-Annual Ranges

Draw	2018			2019			2020		
	max	min	avg	max	min	avg	max	min	avg
105	\$14.36	\$4.00	\$9.75	\$12.88	\$4.14	\$8.54	\$15.29	\$5.15	\$10.60
106	\$13.64	\$4.17	\$9.01	\$11.44	\$4.00	\$7.40	\$14.50	\$4.00	\$8.97
107	\$12.70	\$4.00	\$9.25	\$14.46	\$4.67	\$7.35	\$14.08	\$4.47	\$8.90
108	\$14.74	\$4.00	\$9.69	\$11.70	\$4.00	\$8.32	\$15.00	\$4.00	\$8.34
109	\$15.93	\$4.00	\$8.74	\$12.17	\$4.50	\$8.59	\$16.87	\$6.56	\$11.75
110	\$14.58	\$4.00	\$7.58	\$15.00	\$4.00	\$9.08	\$13.42	\$4.00	\$8.41
111	\$14.44	\$4.00	\$7.98	\$15.12	\$4.00	\$9.59	\$13.92	\$4.00	\$8.42
112	\$15.78	\$4.00	\$8.83	\$14.39	\$6.32	\$10.38	\$15.00	\$4.00	\$9.72
113	\$14.44	\$4.00	\$8.37	\$14.39	\$4.00	\$8.31	\$14.99	\$4.00	\$9.63
114	\$16.20	\$4.00	\$10.96	\$14.71	\$4.00	\$9.62	\$13.39	\$4.00	\$7.14
115	\$15.01	\$4.00	\$8.76	\$12.76	\$4.00	\$7.69	\$13.78	\$4.00	\$6.03
116	\$13.94	\$4.00	\$9.67	\$14.74	\$4.00	\$9.48	\$12.61	\$4.00	\$7.71
117	\$14.50	\$4.00	\$10.35	\$14.39	\$4.00	\$8.05	\$14.92	\$4.00	\$7.88
118	\$16.20	\$4.00	\$8.55	\$14.58	\$4.71	\$10.62	\$13.99	\$4.78	\$9.30
119	\$13.47	\$4.00	\$6.72	\$14.67	\$4.00	\$8.09	\$14.84	\$4.00	\$8.34
120	\$14.10	\$4.00	\$8.55	\$12.01	\$4.00	\$7.42	\$15.00	\$4.00	\$9.11
121	\$11.77	\$4.00	\$6.88	\$14.77	\$4.00	\$9.10	\$15.96	\$4.00	\$7.51
122	\$14.60	\$4.00	\$9.06	\$12.46	\$4.00	\$7.56	\$15.00	\$4.00	\$9.97
123	\$14.66	\$4.73	\$8.26	\$14.60	\$5.50	\$10.47	\$16.59	\$4.00	\$9.29
124	\$13.21	\$4.00	\$8.87	\$13.74	\$4.55	\$8.97	\$12.40	\$4.00	\$8.02
125	\$11.56	\$4.60	\$7.86	\$12.68	\$4.00	\$7.59	\$15.47	\$4.00	\$10.39
126	\$14.30	\$4.00	\$8.82	\$13.06	\$4.00	\$8.89	\$14.84	\$5.64	\$10.28
127	\$14.38	\$5.40	\$10.68	\$15.00	\$5.35	\$9.79	\$13.22	\$4.00	\$10.14
128	\$13.98	\$4.00	\$8.57	\$13.40	\$4.00	\$9.03	\$12.84	\$4.00	\$7.01
129	\$14.50	\$4.00	\$9.26	\$12.28	\$4.89	\$9.23	\$15.37	\$4.00	\$9.41
130	\$14.23	\$4.00	\$8.80	\$14.71	\$4.00	\$9.14	\$16.31	\$4.00	\$9.86
131	\$14.60	\$4.00	\$7.24	\$14.31	\$4.00	\$8.51	\$14.68	\$4.00	\$9.44
132	\$12.41	\$4.00	\$7.30	\$11.52	\$4.00	\$7.60	\$14.92	\$4.00	\$7.98
133	\$12.98	\$4.00	\$10.41	\$14.60	\$4.18	\$10.35	\$12.96	\$4.00	\$8.57
134	\$12.16	\$4.00	\$7.67	\$16.40	\$4.83	\$10.62	\$14.92	\$4.00	\$8.95
135	\$14.38	\$4.00	\$9.21	\$14.54	\$4.00	\$8.73	\$16.59	\$4.00	\$9.03
136	\$12.69	\$4.00	\$9.01	\$16.40	\$4.00	\$8.49	\$16.61	\$4.00	\$9.34
137	\$15.00	\$4.00	\$6.82	\$14.54	\$4.00	\$8.08	\$14.76	\$4.00	\$9.05
138	\$15.00	\$4.00	\$10.01	\$12.89	\$4.00	\$8.09	\$14.92	\$4.91	\$9.60
139	\$13.22	\$4.00	\$7.85	\$13.47	\$4.00	\$10.47	\$14.40	\$4.00	\$7.96
140	\$15.00	\$4.00	\$10.41	\$14.01	\$4.00	\$9.77	\$15.00	\$4.29	\$9.88
141	\$12.74	\$4.00	\$8.67	\$14.39	\$4.00	\$8.22	\$10.59	\$4.00	\$8.32
142	\$15.21	\$4.77	\$9.52	\$16.40	\$4.00	\$10.91	\$16.28	\$4.00	\$8.60
143	\$15.00	\$4.00	\$8.49	\$15.00	\$4.00	\$8.88	\$16.25	\$4.00	\$8.32
144	\$12.42	\$4.30	\$7.42	\$15.00	\$4.00	\$7.92	\$15.00	\$4.72	\$10.62
145	\$14.62	\$4.00	\$9.80	\$12.93	\$4.00	\$8.60	\$15.00	\$4.00	\$8.61
146	\$14.40	\$4.71	\$9.15	\$14.60	\$4.00	\$7.76	\$12.48	\$4.00	\$6.95
147	\$12.37	\$4.00	\$7.29	\$14.67	\$4.00	\$8.86	\$14.99	\$4.00	\$9.30
148	\$15.62	\$4.00	\$8.04	\$12.85	\$4.00	\$9.29	\$13.51	\$4.00	\$8.28
149	\$14.38	\$4.00	\$9.54	\$14.59	\$4.26	\$10.09	\$16.11	\$5.02	\$10.95
150	\$14.06	\$4.00	\$8.62	\$12.16	\$4.00	\$7.12	\$14.27	\$4.00	\$8.91
151	\$13.17	\$4.89	\$8.76	\$15.00	\$4.00	\$8.28	\$14.99	\$4.00	\$9.99
152	\$13.19	\$4.00	\$8.07	\$13.92	\$4.80	\$8.64	\$15.85	\$4.00	\$7.36
153	\$14.26	\$4.00	\$8.49	\$14.39	\$4.00	\$9.12	\$15.02	\$4.00	\$11.71
154	\$14.60	\$4.00	\$8.30	\$16.34	\$4.00	\$9.97	\$12.03	\$4.00	\$7.74
155	\$15.00	\$4.00	\$9.81	\$16.13	\$4.00	\$9.76	\$14.59	\$4.00	\$9.70
156	\$16.20	\$4.00	\$7.84	\$16.40	\$4.69	\$10.00	\$13.23	\$4.00	\$10.35

Nymex Detail-Annual Ranges

Draw	2018			2019			2020		
	max	min	avg	max	min	avg	max	min	avg
157	\$14.03	\$4.00	\$8.20	\$16.40	\$4.23	\$10.40	\$14.84	\$4.00	\$7.72
158	\$14.50	\$5.62	\$9.69	\$14.47	\$4.00	\$9.33	\$15.00	\$4.00	\$8.59
159	\$13.92	\$4.00	\$8.16	\$15.98	\$4.00	\$9.40	\$15.66	\$4.00	\$9.12
160	\$14.08	\$4.00	\$8.12	\$14.54	\$4.00	\$8.86	\$13.85	\$4.77	\$8.62
161	\$14.38	\$4.84	\$8.77	\$14.42	\$4.00	\$9.30	\$15.77	\$4.63	\$10.59
162	\$11.65	\$5.33	\$9.01	\$15.00	\$4.00	\$9.32	\$14.83	\$4.00	\$8.38
163	\$15.53	\$4.00	\$8.70	\$16.40	\$4.00	\$9.46	\$15.00	\$4.46	\$8.45
164	\$15.44	\$4.00	\$8.75	\$13.76	\$5.54	\$9.76	\$13.89	\$4.00	\$8.46
165	\$16.20	\$4.00	\$9.33	\$14.46	\$6.41	\$10.04	\$14.92	\$4.00	\$9.26
166	\$15.00	\$5.15	\$8.53	\$13.69	\$4.00	\$8.48	\$15.00	\$4.00	\$8.23
167	\$15.19	\$4.00	\$9.12	\$14.54	\$4.00	\$9.16	\$14.27	\$4.16	\$9.28
168	\$16.20	\$5.66	\$9.48	\$14.77	\$4.00	\$8.96	\$14.76	\$4.00	\$9.25
169	\$14.20	\$4.00	\$7.01	\$15.00	\$4.00	\$7.67	\$14.20	\$4.00	\$9.73
170	\$14.15	\$4.03	\$9.54	\$14.60	\$5.40	\$9.98	\$13.05	\$4.00	\$7.42
171	\$14.44	\$4.51	\$8.16	\$16.13	\$4.00	\$9.44	\$14.41	\$6.50	\$11.03
172	\$13.27	\$4.00	\$8.20	\$14.40	\$4.00	\$9.87	\$14.35	\$4.00	\$8.68
173	\$14.72	\$4.00	\$8.15	\$16.02	\$4.00	\$9.50	\$14.99	\$4.00	\$9.19
174	\$14.38	\$4.00	\$7.64	\$14.46	\$4.00	\$8.79	\$15.83	\$4.90	\$10.42
175	\$14.18	\$4.00	\$7.48	\$14.77	\$4.00	\$9.98	\$13.86	\$4.00	\$8.47
176	\$14.65	\$5.23	\$9.35	\$13.51	\$4.00	\$8.21	\$14.81	\$4.00	\$8.65
177	\$11.67	\$4.00	\$7.49	\$12.35	\$4.00	\$8.28	\$15.39	\$4.00	\$7.11
178	\$12.55	\$4.00	\$7.84	\$14.77	\$4.00	\$8.35	\$15.00	\$4.00	\$8.75
179	\$12.01	\$4.00	\$7.26	\$14.89	\$4.00	\$9.07	\$15.19	\$4.00	\$9.68
180	\$15.33	\$4.00	\$8.93	\$12.69	\$4.00	\$8.51	\$13.85	\$4.00	\$6.75
181	\$13.74	\$4.17	\$9.95	\$16.03	\$4.00	\$8.93	\$16.87	\$4.00	\$10.23
182	\$14.09	\$4.00	\$7.87	\$14.39	\$4.06	\$9.26	\$14.76	\$4.00	\$9.51
183	\$14.30	\$4.10	\$8.87	\$12.76	\$4.00	\$7.50	\$15.14	\$5.97	\$9.20
184	\$15.93	\$4.00	\$8.95	\$15.00	\$4.00	\$9.67	\$13.34	\$4.42	\$10.29
185	\$14.38	\$4.00	\$8.04	\$10.85	\$4.00	\$7.73	\$15.00	\$4.00	\$8.98
186	\$15.66	\$4.00	\$9.20	\$15.00	\$5.38	\$9.54	\$13.68	\$4.00	\$7.33
187	\$16.02	\$4.00	\$9.35	\$11.99	\$4.00	\$7.99	\$15.00	\$4.00	\$6.82
188	\$12.88	\$4.00	\$8.42	\$16.40	\$4.00	\$8.68	\$11.84	\$4.00	\$7.53
189	\$14.50	\$4.00	\$9.23	\$12.28	\$4.00	\$7.38	\$11.70	\$4.23	\$7.44
190	\$14.11	\$4.00	\$7.79	\$14.87	\$4.00	\$8.74	\$14.20	\$4.00	\$8.90
191	\$16.20	\$4.00	\$9.19	\$14.77	\$4.00	\$9.27	\$13.17	\$4.00	\$7.18
192	\$12.99	\$4.00	\$7.12	\$14.94	\$4.00	\$9.25	\$14.15	\$4.00	\$8.73
193	\$11.89	\$6.66	\$9.32	\$14.64	\$4.00	\$9.04	\$13.04	\$4.00	\$7.31
194	\$14.44	\$4.00	\$8.35	\$14.46	\$4.00	\$7.30	\$16.20	\$4.00	\$8.19
195	\$14.60	\$4.00	\$8.61	\$14.54	\$4.00	\$8.57	\$16.59	\$4.00	\$9.04
196	\$15.71	\$5.97	\$9.93	\$11.35	\$4.00	\$8.15	\$16.29	\$4.00	\$10.40
197	\$12.80	\$4.00	\$7.07	\$14.18	\$4.00	\$8.73	\$14.48	\$4.00	\$8.49
198	\$13.26	\$4.31	\$8.44	\$14.60	\$4.00	\$9.39	\$15.00	\$4.00	\$9.12
199	\$16.20	\$4.00	\$10.45	\$15.00	\$4.00	\$8.65	\$15.02	\$4.00	\$8.09
200	\$14.02	\$4.00	\$8.01	\$14.60	\$4.00	\$8.67	\$13.17	\$4.00	\$9.04
average	\$14.15	\$4.24	\$8.64	\$14.32	\$4.16	\$8.78	\$14.50	\$4.23	\$8.84
Max	\$16.20			\$16.40			\$16.87		
Avg			\$8.64			\$8.78			\$8.84
Min	\$4.00			\$4.00			\$4.00		
Range	12.20			12.40			12.87		

Nymex Detail-Annual Ranges

Draw	2021			2022			2023		
	max	min	avg	max	min	avg	max	min	avg
1	\$15.00	\$4.00	\$8.08	\$17.31	\$4.00	\$10.37	\$13.98	\$4.80	\$9.02
2	\$15.03	\$4.00	\$9.65	\$11.85	\$4.00	\$7.22	\$16.41	\$6.97	\$12.18
3	\$15.00	\$4.00	\$7.02	\$15.88	\$4.00	\$8.26	\$15.00	\$4.00	\$8.90
4	\$15.01	\$4.00	\$8.98	\$15.00	\$4.00	\$8.04	\$8.38	\$4.00	\$5.96
5	\$15.03	\$4.51	\$9.29	\$11.16	\$4.00	\$7.20	\$15.78	\$4.00	\$7.83
6	\$13.30	\$4.00	\$7.25	\$17.51	\$4.00	\$8.15	\$18.29	\$4.00	\$9.81
7	\$14.88	\$4.00	\$8.87	\$15.00	\$4.00	\$7.85	\$15.00	\$6.10	\$10.82
8	\$15.76	\$4.00	\$8.17	\$17.82	\$4.00	\$9.23	\$13.61	\$4.00	\$8.68
9	\$15.19	\$4.00	\$8.36	\$15.00	\$4.00	\$8.91	\$13.37	\$4.56	\$9.06
10	\$15.03	\$4.00	\$10.47	\$15.00	\$4.00	\$8.75	\$13.81	\$4.00	\$8.66
11	\$15.03	\$4.00	\$8.49	\$14.63	\$4.00	\$10.08	\$15.00	\$4.00	\$10.17
12	\$9.90	\$4.00	\$6.40	\$15.00	\$4.00	\$8.64	\$11.71	\$4.01	\$7.81
13	\$16.60	\$4.00	\$9.15	\$16.75	\$4.00	\$8.98	\$16.20	\$4.00	\$10.18
14	\$15.03	\$4.00	\$8.20	\$16.51	\$4.00	\$9.42	\$14.79	\$4.00	\$7.38
15	\$15.00	\$4.00	\$9.52	\$11.79	\$4.00	\$7.45	\$15.11	\$4.00	\$9.23
16	\$15.00	\$4.00	\$9.63	\$13.32	\$4.00	\$7.68	\$15.00	\$4.00	\$10.15
17	\$11.88	\$4.00	\$7.53	\$15.50	\$4.00	\$8.88	\$15.00	\$4.00	\$8.16
18	\$12.77	\$4.00	\$7.44	\$17.82	\$4.00	\$7.48	\$15.00	\$4.00	\$8.15
19	\$13.60	\$4.00	\$9.11	\$17.54	\$4.00	\$8.74	\$12.59	\$4.00	\$8.28
20	\$15.74	\$4.00	\$9.79	\$17.51	\$4.00	\$10.16	\$15.00	\$4.00	\$9.73
21	\$15.03	\$4.00	\$9.75	\$14.38	\$4.00	\$8.33	\$15.00	\$4.00	\$8.89
22	\$15.00	\$4.00	\$9.15	\$14.50	\$4.00	\$9.77	\$14.37	\$5.33	\$9.32
23	\$15.19	\$4.00	\$7.18	\$14.59	\$4.00	\$9.68	\$15.00	\$4.00	\$10.74
24	\$13.11	\$4.00	\$8.74	\$14.36	\$4.00	\$8.14	\$18.46	\$4.00	\$9.58
25	\$13.39	\$4.00	\$8.06	\$17.51	\$4.00	\$7.90	\$17.72	\$4.00	\$7.94
26	\$14.58	\$4.00	\$8.26	\$15.23	\$5.03	\$9.79	\$15.41	\$4.00	\$9.52
27	\$15.00	\$4.00	\$10.54	\$15.66	\$4.00	\$9.30	\$15.00	\$4.00	\$8.82
28	\$15.00	\$4.00	\$8.96	\$15.00	\$4.00	\$6.95	\$15.00	\$4.00	\$8.52
29	\$15.43	\$4.00	\$7.57	\$13.86	\$4.00	\$9.39	\$18.13	\$4.00	\$9.27
30	\$17.21	\$4.00	\$9.40	\$15.00	\$4.00	\$8.89	\$15.22	\$4.00	\$8.39
31	\$15.00	\$4.00	\$8.05	\$15.00	\$4.00	\$7.29	\$15.80	\$4.00	\$9.81
32	\$12.98	\$4.00	\$8.57	\$15.00	\$4.00	\$7.62	\$15.28	\$4.00	\$8.98
33	\$13.11	\$4.00	\$9.10	\$17.82	\$4.00	\$9.88	\$18.46	\$4.48	\$10.80
34	\$15.00	\$5.30	\$10.01	\$12.91	\$4.00	\$7.78	\$15.00	\$4.00	\$8.30
35	\$15.19	\$4.00	\$7.99	\$15.00	\$4.00	\$8.55	\$13.04	\$4.00	\$9.05
36	\$11.62	\$4.00	\$7.22	\$15.00	\$4.00	\$8.57	\$15.61	\$4.00	\$8.66
37	\$14.72	\$6.35	\$10.64	\$17.31	\$4.00	\$9.46	\$18.46	\$4.00	\$9.87
38	\$15.03	\$4.00	\$7.99	\$15.00	\$4.00	\$10.53	\$16.75	\$4.00	\$8.50
39	\$15.00	\$4.00	\$8.70	\$15.72	\$4.00	\$9.83	\$18.13	\$4.64	\$10.97
40	\$15.00	\$4.17	\$9.48	\$16.01	\$4.00	\$9.04	\$15.00	\$4.03	\$11.11
41	\$12.66	\$4.00	\$8.02	\$14.80	\$4.00	\$7.80	\$17.16	\$7.16	\$10.85
42	\$15.00	\$4.00	\$7.00	\$17.51	\$4.33	\$11.51	\$15.00	\$4.00	\$9.79
43	\$13.91	\$4.00	\$9.69	\$15.09	\$4.46	\$9.58	\$15.00	\$4.00	\$9.84
44	\$15.00	\$4.00	\$7.76	\$15.00	\$4.00	\$9.56	\$15.00	\$4.00	\$7.14
45	\$15.07	\$4.00	\$7.99	\$12.63	\$4.00	\$7.87	\$15.00	\$4.00	\$8.43
46	\$12.74	\$4.00	\$8.07	\$11.85	\$4.00	\$6.56	\$16.65	\$4.00	\$8.87
47	\$15.00	\$4.00	\$8.18	\$15.50	\$4.00	\$10.50	\$15.40	\$4.00	\$10.49
48	\$14.52	\$4.00	\$6.98	\$14.50	\$4.00	\$9.38	\$15.39	\$5.37	\$9.01
49	\$14.08	\$4.00	\$8.53	\$13.73	\$4.00	\$8.03	\$15.00	\$4.00	\$9.37
50	\$15.00	\$4.00	\$9.19	\$15.60	\$4.00	\$9.18	\$17.39	\$4.00	\$8.03
51	\$11.82	\$4.26	\$8.93	\$15.00	\$4.79	\$8.91	\$17.11	\$4.00	\$8.82
52	\$15.00	\$4.00	\$9.56	\$17.36	\$4.00	\$8.65	\$15.00	\$4.00	\$8.58

Nymex Detail-Annual Ranges

Draw	2021			2022			2023		
	max	min	avg	max	min	avg	max	min	avg
53	\$15.00	\$4.00	\$9.18	\$15.00	\$4.00	\$7.49	\$15.00	\$4.00	\$9.70
54	\$12.75	\$4.00	\$5.87	\$15.00	\$4.00	\$9.28	\$15.64	\$4.00	\$9.41
55	\$13.98	\$4.00	\$8.28	\$15.00	\$4.00	\$8.66	\$15.00	\$4.00	\$9.32
56	\$17.21	\$4.00	\$9.54	\$14.56	\$4.00	\$7.50	\$13.41	\$4.00	\$7.33
57	\$13.45	\$4.00	\$8.83	\$15.00	\$4.00	\$8.57	\$13.77	\$4.00	\$6.55
58	\$15.00	\$4.00	\$8.41	\$15.00	\$4.00	\$8.80	\$15.00	\$4.00	\$9.95
59	\$12.10	\$4.00	\$6.57	\$15.92	\$4.00	\$9.22	\$18.46	\$4.00	\$9.57
60	\$15.00	\$4.00	\$7.57	\$15.46	\$4.00	\$7.00	\$18.46	\$5.19	\$12.22
61	\$14.57	\$4.00	\$6.99	\$15.80	\$4.00	\$9.82	\$16.01	\$4.00	\$9.19
62	\$15.03	\$4.84	\$9.81	\$17.13	\$4.00	\$7.82	\$15.00	\$4.00	\$7.53
63	\$11.80	\$4.00	\$7.06	\$16.09	\$4.00	\$8.55	\$15.00	\$4.00	\$9.45
64	\$15.03	\$4.00	\$7.02	\$17.51	\$4.00	\$8.77	\$18.46	\$4.00	\$8.49
65	\$13.60	\$4.00	\$8.73	\$17.82	\$4.00	\$9.41	\$15.00	\$4.00	\$9.02
66	\$13.88	\$4.00	\$7.93	\$15.00	\$4.00	\$8.83	\$15.00	\$4.00	\$7.64
67	\$13.65	\$4.00	\$9.48	\$13.20	\$4.00	\$8.94	\$11.42	\$4.00	\$7.57
68	\$15.76	\$4.46	\$9.93	\$15.20	\$4.00	\$9.37	\$13.10	\$4.17	\$9.04
69	\$15.03	\$4.00	\$10.19	\$14.01	\$4.00	\$8.33	\$15.00	\$4.00	\$10.60
70	\$15.56	\$4.00	\$8.14	\$15.00	\$4.00	\$7.45	\$13.02	\$4.00	\$8.70
71	\$12.72	\$4.00	\$7.19	\$16.29	\$4.00	\$9.12	\$15.00	\$4.45	\$9.89
72	\$17.21	\$4.00	\$10.36	\$17.82	\$4.00	\$9.12	\$13.90	\$4.00	\$8.22
73	\$15.91	\$4.00	\$8.42	\$17.82	\$4.00	\$10.08	\$15.00	\$4.00	\$9.68
74	\$17.21	\$4.00	\$9.80	\$15.50	\$4.00	\$8.87	\$16.01	\$4.00	\$9.36
75	\$15.03	\$4.00	\$7.52	\$15.86	\$4.00	\$10.24	\$14.64	\$4.00	\$6.76
76	\$14.11	\$4.00	\$5.79	\$15.00	\$4.00	\$9.75	\$14.54	\$4.00	\$9.50
77	\$15.26	\$4.00	\$9.51	\$15.00	\$4.00	\$10.69	\$15.00	\$4.00	\$7.26
78	\$13.59	\$4.00	\$8.68	\$15.00	\$4.00	\$9.70	\$15.00	\$4.00	\$9.18
79	\$15.00	\$4.00	\$8.75	\$15.64	\$4.00	\$9.66	\$17.13	\$4.00	\$8.89
80	\$13.16	\$4.00	\$7.89	\$15.00	\$8.36	\$11.70	\$12.51	\$4.00	\$7.32
81	\$14.77	\$4.00	\$8.74	\$14.15	\$4.00	\$9.04	\$14.34	\$4.00	\$6.87
82	\$15.00	\$4.00	\$9.08	\$17.82	\$4.00	\$9.00	\$15.00	\$4.00	\$8.12
83	\$15.00	\$4.00	\$8.57	\$15.88	\$4.00	\$8.18	\$18.13	\$4.00	\$9.88
84	\$14.84	\$4.00	\$6.94	\$15.71	\$5.32	\$10.70	\$16.01	\$4.00	\$9.76
85	\$15.10	\$4.00	\$6.72	\$15.50	\$4.00	\$7.99	\$12.58	\$4.00	\$6.75
86	\$15.00	\$4.00	\$10.68	\$12.94	\$4.85	\$9.47	\$16.29	\$4.00	\$9.83
87	\$10.29	\$4.00	\$6.17	\$15.00	\$4.00	\$8.03	\$15.00	\$4.00	\$9.10
88	\$16.40	\$4.04	\$9.57	\$13.35	\$4.00	\$7.99	\$15.47	\$4.00	\$8.34
89	\$11.74	\$4.00	\$7.29	\$15.00	\$4.00	\$6.66	\$18.13	\$4.00	\$10.46
90	\$13.05	\$4.00	\$9.35	\$16.63	\$4.00	\$8.52	\$14.87	\$4.83	\$9.20
91	\$15.19	\$4.00	\$9.47	\$15.68	\$4.00	\$7.66	\$18.46	\$4.00	\$9.01
92	\$13.97	\$4.26	\$10.21	\$15.36	\$4.00	\$8.89	\$15.60	\$4.00	\$10.28
93	\$13.29	\$4.00	\$8.14	\$15.91	\$4.00	\$9.34	\$13.89	\$4.00	\$9.35
94	\$15.00	\$4.00	\$8.67	\$17.82	\$4.00	\$9.12	\$15.00	\$4.00	\$7.22
95	\$15.00	\$4.00	\$8.62	\$15.00	\$4.00	\$9.06	\$14.74	\$4.00	\$9.62
96	\$14.43	\$4.16	\$9.11	\$17.51	\$4.00	\$8.81	\$17.47	\$6.13	\$11.00
97	\$15.00	\$4.00	\$9.06	\$10.83	\$4.00	\$7.69	\$17.49	\$4.15	\$12.08
98	\$15.00	\$4.00	\$7.86	\$16.49	\$4.00	\$9.50	\$14.24	\$5.20	\$8.26
99	\$16.91	\$4.00	\$9.27	\$15.93	\$6.14	\$10.55	\$13.88	\$5.86	\$10.12
100	\$11.18	\$4.00	\$6.58	\$15.00	\$4.00	\$9.01	\$15.00	\$4.00	\$9.03
101	\$15.00	\$4.00	\$8.79	\$15.00	\$4.00	\$7.48	\$14.25	\$4.00	\$8.89
102	\$15.00	\$4.00	\$8.98	\$16.92	\$4.00	\$9.96	\$15.00	\$4.00	\$7.33
103	\$15.00	\$4.00	\$9.54	\$15.00	\$4.00	\$9.27	\$16.28	\$4.00	\$9.34
104	\$12.57	\$4.00	\$8.72	\$15.03	\$4.00	\$9.67	\$16.09	\$4.00	\$9.35

Nymex Detail-Annual Ranges

Draw	2021			2022			2023		
	max	min	avg	max	min	avg	max	min	avg
105	\$15.03	\$4.00	\$9.29	\$12.91	\$4.00	\$6.95	\$14.48	\$4.10	\$8.80
106	\$13.09	\$4.00	\$8.54	\$13.98	\$4.00	\$7.77	\$18.46	\$4.00	\$9.36
107	\$15.01	\$4.00	\$8.63	\$13.28	\$4.00	\$7.71	\$18.46	\$4.00	\$9.93
108	\$13.87	\$4.00	\$8.63	\$14.99	\$4.00	\$7.63	\$15.00	\$4.00	\$10.13
109	\$15.19	\$4.00	\$10.15	\$15.00	\$4.00	\$8.82	\$15.00	\$4.00	\$9.05
110	\$14.20	\$4.00	\$8.53	\$15.68	\$4.00	\$10.21	\$15.00	\$5.05	\$10.21
111	\$15.30	\$4.00	\$8.46	\$12.33	\$4.00	\$8.65	\$15.00	\$4.00	\$9.55
112	\$12.02	\$4.00	\$6.66	\$15.00	\$4.00	\$7.32	\$13.50	\$4.00	\$9.38
113	\$17.21	\$4.00	\$9.05	\$15.68	\$4.00	\$8.53	\$14.26	\$4.00	\$8.72
114	\$15.00	\$4.00	\$9.58	\$17.82	\$4.00	\$9.02	\$15.00	\$4.00	\$8.81
115	\$14.94	\$4.00	\$8.64	\$17.82	\$4.00	\$8.62	\$16.57	\$4.00	\$9.77
116	\$15.03	\$4.00	\$9.14	\$15.68	\$4.00	\$9.62	\$14.77	\$4.00	\$9.39
117	\$16.15	\$4.00	\$8.77	\$15.00	\$6.25	\$10.95	\$15.53	\$4.00	\$11.21
118	\$17.21	\$4.00	\$8.84	\$14.04	\$4.00	\$8.00	\$15.35	\$4.00	\$9.15
119	\$15.00	\$4.00	\$8.18	\$15.50	\$4.00	\$8.19	\$17.81	\$4.00	\$8.67
120	\$15.00	\$4.10	\$9.08	\$15.68	\$4.00	\$10.37	\$15.00	\$4.52	\$8.94
121	\$13.76	\$5.26	\$9.33	\$15.00	\$4.00	\$7.54	\$15.00	\$4.00	\$9.67
122	\$15.00	\$4.00	\$8.16	\$13.84	\$4.00	\$8.01	\$15.00	\$4.00	\$10.19
123	\$15.00	\$4.09	\$10.54	\$15.00	\$4.00	\$8.70	\$15.00	\$5.58	\$10.49
124	\$15.03	\$4.00	\$8.70	\$15.00	\$4.00	\$10.19	\$15.00	\$4.00	\$8.60
125	\$15.00	\$4.00	\$8.51	\$15.56	\$4.00	\$9.81	\$11.32	\$4.00	\$6.35
126	\$16.24	\$4.11	\$9.07	\$11.83	\$4.00	\$8.04	\$18.46	\$4.60	\$10.89
127	\$15.41	\$6.88	\$11.45	\$16.68	\$4.00	\$9.32	\$15.00	\$4.05	\$9.35
128	\$15.00	\$4.00	\$10.09	\$15.00	\$4.00	\$9.52	\$16.20	\$4.00	\$9.43
129	\$15.00	\$4.08	\$8.50	\$16.32	\$4.00	\$8.22	\$16.01	\$4.00	\$10.62
130	\$12.96	\$4.71	\$8.77	\$15.44	\$4.00	\$7.44	\$16.01	\$4.00	\$9.67
131	\$13.31	\$4.00	\$7.68	\$12.18	\$4.00	\$7.57	\$15.00	\$4.00	\$7.82
132	\$15.00	\$4.00	\$8.40	\$15.00	\$4.00	\$9.01	\$13.95	\$4.00	\$8.38
133	\$15.00	\$4.00	\$9.13	\$15.00	\$4.00	\$8.97	\$15.00	\$4.00	\$8.31
134	\$16.98	\$4.00	\$8.52	\$15.00	\$4.00	\$8.58	\$15.00	\$4.00	\$8.32
135	\$14.96	\$4.00	\$7.50	\$15.68	\$4.00	\$10.79	\$18.13	\$4.25	\$10.60
136	\$14.42	\$4.00	\$10.07	\$15.50	\$4.00	\$8.18	\$11.31	\$4.00	\$7.12
137	\$15.00	\$4.00	\$7.98	\$15.68	\$4.00	\$9.81	\$18.46	\$4.00	\$8.06
138	\$14.41	\$4.00	\$7.04	\$15.00	\$4.00	\$7.96	\$18.46	\$4.00	\$9.14
139	\$13.06	\$4.00	\$8.67	\$17.51	\$4.54	\$10.63	\$16.20	\$4.00	\$9.44
140	\$17.21	\$4.00	\$6.89	\$15.00	\$4.00	\$8.62	\$15.46	\$4.00	\$8.44
141	\$13.71	\$4.00	\$7.40	\$15.50	\$4.00	\$8.94	\$17.94	\$4.00	\$8.41
142	\$12.60	\$4.47	\$9.05	\$15.00	\$4.00	\$7.69	\$18.07	\$4.00	\$9.90
143	\$12.88	\$4.00	\$8.42	\$16.14	\$4.00	\$11.16	\$15.00	\$4.00	\$9.12
144	\$14.01	\$4.00	\$7.74	\$17.51	\$4.00	\$8.89	\$13.55	\$4.00	\$7.17
145	\$14.17	\$4.00	\$7.52	\$17.82	\$4.00	\$10.90	\$18.46	\$4.00	\$9.78
146	\$15.00	\$4.00	\$7.94	\$17.36	\$4.00	\$8.96	\$15.00	\$4.00	\$9.65
147	\$15.00	\$4.00	\$8.30	\$17.51	\$4.51	\$10.48	\$18.13	\$4.00	\$11.15
148	\$12.81	\$4.00	\$6.95	\$15.37	\$4.00	\$8.71	\$14.21	\$4.00	\$6.79
149	\$15.00	\$4.00	\$9.20	\$14.68	\$4.00	\$9.52	\$12.36	\$4.00	\$7.20
150	\$16.91	\$4.00	\$9.52	\$15.00	\$4.00	\$8.63	\$14.09	\$4.00	\$8.23
151	\$15.00	\$4.00	\$8.75	\$14.61	\$4.00	\$8.35	\$14.88	\$5.77	\$10.50
152	\$13.44	\$4.00	\$8.39	\$14.10	\$4.00	\$8.33	\$16.01	\$4.00	\$10.10
153	\$15.19	\$4.00	\$8.62	\$13.28	\$4.00	\$8.28	\$16.15	\$4.00	\$7.26
154	\$15.00	\$4.00	\$8.82	\$13.31	\$4.00	\$7.66	\$14.54	\$4.00	\$8.33
155	\$17.21	\$4.00	\$10.15	\$16.55	\$4.00	\$8.75	\$15.00	\$4.00	\$9.12
156	\$15.00	\$4.00	\$8.34	\$17.82	\$4.00	\$9.82	\$16.20	\$5.41	\$10.62

Nymex Detail-Annual Ranges

Draw	2021			2022			2023		
	max	min	avg	max	min	avg	max	min	avg
157	\$17.07	\$4.00	\$8.58	\$14.62	\$4.00	\$8.40	\$12.96	\$4.00	\$7.50
158	\$11.30	\$4.00	\$6.00	\$15.10	\$4.00	\$6.88	\$14.97	\$4.00	\$8.89
159	\$14.89	\$4.00	\$7.71	\$15.00	\$4.00	\$8.87	\$15.00	\$4.00	\$8.47
160	\$15.00	\$4.00	\$6.91	\$17.48	\$4.00	\$11.01	\$15.00	\$4.00	\$8.77
161	\$15.03	\$4.00	\$10.15	\$11.26	\$4.00	\$6.69	\$15.73	\$4.00	\$8.24
162	\$13.45	\$4.00	\$7.54	\$15.00	\$4.00	\$8.32	\$16.01	\$4.00	\$8.39
163	\$15.00	\$5.10	\$8.95	\$17.82	\$4.00	\$8.70	\$18.13	\$4.00	\$8.67
164	\$15.00	\$4.00	\$8.17	\$11.64	\$4.00	\$8.13	\$16.40	\$4.00	\$7.35
165	\$11.46	\$4.00	\$6.72	\$14.25	\$4.00	\$8.66	\$15.11	\$4.00	\$9.72
166	\$12.79	\$4.00	\$8.49	\$15.00	\$4.00	\$8.58	\$15.00	\$4.00	\$9.84
167	\$10.64	\$4.00	\$7.39	\$15.00	\$4.00	\$9.12	\$15.00	\$4.00	\$7.01
168	\$17.21	\$4.00	\$9.53	\$15.00	\$4.00	\$9.93	\$15.18	\$4.00	\$10.57
169	\$15.00	\$4.00	\$8.23	\$15.68	\$4.00	\$9.61	\$14.15	\$4.00	\$9.48
170	\$14.82	\$4.00	\$9.22	\$15.00	\$4.00	\$7.50	\$13.89	\$4.00	\$9.18
171	\$14.28	\$4.00	\$8.54	\$15.05	\$4.00	\$10.66	\$16.01	\$4.00	\$8.76
172	\$17.21	\$4.00	\$11.11	\$13.79	\$4.00	\$9.33	\$14.64	\$4.82	\$9.15
173	\$14.05	\$4.00	\$7.05	\$12.87	\$4.00	\$7.66	\$15.00	\$4.00	\$9.30
174	\$15.00	\$4.00	\$9.44	\$16.36	\$4.00	\$10.20	\$15.41	\$4.00	\$9.76
175	\$15.00	\$4.00	\$9.61	\$15.00	\$4.00	\$8.97	\$16.20	\$4.00	\$9.12
176	\$15.00	\$4.00	\$7.78	\$15.00	\$4.00	\$9.06	\$11.46	\$4.00	\$8.68
177	\$12.46	\$4.00	\$5.86	\$13.73	\$4.00	\$9.35	\$18.13	\$4.00	\$10.80
178	\$14.06	\$4.00	\$8.69	\$17.51	\$4.00	\$10.19	\$12.41	\$4.00	\$8.00
179	\$13.69	\$4.00	\$9.17	\$15.27	\$4.00	\$9.05	\$16.20	\$4.00	\$8.61
180	\$15.00	\$4.44	\$10.85	\$17.82	\$4.00	\$9.82	\$15.58	\$5.13	\$10.27
181	\$15.51	\$7.19	\$11.48	\$17.82	\$4.00	\$8.20	\$18.46	\$4.00	\$10.70
182	\$11.75	\$4.00	\$6.99	\$15.06	\$4.00	\$9.09	\$18.39	\$4.00	\$9.53
183	\$12.52	\$4.00	\$8.60	\$11.51	\$4.00	\$7.16	\$13.74	\$4.00	\$6.87
184	\$15.00	\$4.00	\$9.29	\$15.00	\$4.00	\$8.45	\$15.00	\$5.74	\$9.95
185	\$15.00	\$4.00	\$8.29	\$15.65	\$4.00	\$9.58	\$16.61	\$4.00	\$9.68
186	\$15.00	\$4.00	\$8.67	\$14.34	\$4.00	\$7.97	\$16.38	\$4.00	\$8.45
187	\$15.00	\$4.00	\$7.84	\$15.00	\$4.00	\$8.10	\$17.52	\$4.00	\$9.71
188	\$15.00	\$4.00	\$8.84	\$15.00	\$4.62	\$9.99	\$16.22	\$4.00	\$9.73
189	\$14.02	\$4.00	\$8.68	\$15.00	\$4.00	\$9.52	\$14.84	\$4.00	\$7.97
190	\$11.27	\$4.00	\$7.53	\$15.50	\$4.48	\$9.52	\$15.00	\$4.00	\$9.38
191	\$11.32	\$4.00	\$6.95	\$15.00	\$4.00	\$8.67	\$16.61	\$5.73	\$11.16
192	\$11.86	\$4.00	\$8.40	\$15.00	\$4.00	\$7.91	\$15.00	\$4.00	\$9.87
193	\$15.00	\$4.00	\$9.37	\$15.50	\$4.00	\$10.20	\$16.13	\$4.00	\$10.17
194	\$15.00	\$4.00	\$9.46	\$13.61	\$4.00	\$8.25	\$18.46	\$4.00	\$9.71
195	\$14.40	\$4.00	\$8.00	\$17.82	\$4.00	\$9.54	\$14.81	\$4.00	\$7.90
196	\$15.00	\$5.02	\$10.00	\$17.52	\$4.00	\$9.13	\$14.93	\$4.00	\$7.45
197	\$14.92	\$4.00	\$9.30	\$14.94	\$4.00	\$9.00	\$17.32	\$4.00	\$9.92
198	\$15.00	\$4.00	\$8.54	\$15.00	\$4.00	\$7.84	\$15.06	\$4.00	\$10.83
199	\$15.00	\$4.00	\$8.22	\$15.00	\$4.00	\$9.00	\$17.64	\$4.00	\$10.38
200	\$15.00	\$4.00	\$9.56	\$15.31	\$4.00	\$9.18	\$18.34	\$4.00	\$10.08
average	\$14.50	\$4.09	\$8.56	\$15.28	\$4.08	\$8.86	\$15.46	\$4.17	\$9.11
Max	\$17.21			\$17.82			\$18.46		
Avg			\$8.56			\$8.86			\$9.11
Min	\$4.00			\$4.00			\$4.00		
Range	13.21			13.82			14.46		

Nymex Detail-Annual Ranges

Draw	2024			2025			2026		
	max	min	avg	max	min	avg	max	min	avg
1	\$15.00	\$4.00	\$7.37	\$15.00	\$4.00	\$8.04	\$16.60	\$4.00	\$9.63
2	\$13.47	\$4.00	\$8.24	\$17.00	\$4.00	\$10.15	\$15.00	\$4.00	\$10.89
3	\$15.00	\$4.00	\$9.01	\$16.91	\$5.16	\$10.28	\$20.00	\$4.00	\$9.95
4	\$15.00	\$4.99	\$9.13	\$15.37	\$4.54	\$10.17	\$17.30	\$4.00	\$8.98
5	\$16.70	\$4.00	\$10.59	\$16.00	\$4.00	\$9.61	\$17.52	\$4.00	\$9.73
6	\$16.00	\$4.00	\$9.28	\$18.35	\$4.00	\$11.87	\$20.00	\$5.85	\$10.14
7	\$13.88	\$4.00	\$9.33	\$16.91	\$4.00	\$9.58	\$15.00	\$4.00	\$8.99
8	\$15.89	\$4.00	\$10.59	\$17.71	\$6.73	\$11.12	\$17.59	\$4.00	\$12.38
9	\$15.00	\$4.00	\$10.26	\$19.60	\$6.44	\$10.21	\$16.37	\$4.00	\$11.04
10	\$15.36	\$4.00	\$8.83	\$15.00	\$4.00	\$9.50	\$17.30	\$4.00	\$10.38
11	\$14.33	\$4.00	\$7.98	\$14.93	\$6.34	\$10.85	\$15.25	\$4.00	\$9.39
12	\$18.83	\$4.00	\$9.88	\$15.24	\$4.00	\$10.47	\$15.92	\$4.00	\$9.13
13	\$19.12	\$4.00	\$11.01	\$16.39	\$4.00	\$9.90	\$18.04	\$4.74	\$10.81
14	\$15.00	\$4.00	\$9.60	\$15.03	\$4.00	\$9.00	\$15.00	\$4.00	\$8.13
15	\$17.73	\$4.00	\$11.41	\$14.78	\$4.00	\$10.95	\$15.00	\$4.00	\$7.88
16	\$16.58	\$4.00	\$9.29	\$17.43	\$5.14	\$11.63	\$15.05	\$4.00	\$9.58
17	\$15.00	\$4.00	\$9.71	\$12.78	\$4.00	\$7.81	\$17.27	\$4.00	\$9.01
18	\$16.78	\$4.00	\$8.32	\$15.99	\$4.00	\$7.87	\$14.38	\$4.00	\$8.21
19	\$15.00	\$4.00	\$7.77	\$14.15	\$4.00	\$7.66	\$19.73	\$4.00	\$8.99
20	\$16.30	\$4.00	\$8.85	\$14.17	\$4.00	\$9.37	\$15.00	\$4.00	\$9.98
21	\$15.00	\$4.00	\$9.88	\$16.87	\$4.00	\$9.40	\$16.84	\$4.00	\$11.20
22	\$16.25	\$4.00	\$9.39	\$16.91	\$4.00	\$10.35	\$15.00	\$7.62	\$10.90
23	\$15.61	\$4.08	\$10.93	\$19.60	\$4.00	\$11.40	\$15.61	\$4.00	\$8.67
24	\$16.58	\$4.00	\$9.78	\$18.16	\$4.00	\$9.90	\$16.10	\$5.81	\$11.77
25	\$15.00	\$4.06	\$9.94	\$15.00	\$4.00	\$8.14	\$13.42	\$4.00	\$8.42
26	\$16.58	\$4.00	\$9.35	\$18.10	\$4.00	\$9.71	\$16.11	\$5.79	\$10.86
27	\$15.00	\$4.00	\$10.23	\$15.00	\$4.00	\$7.69	\$13.44	\$4.00	\$7.90
28	\$13.27	\$4.00	\$9.87	\$15.00	\$4.00	\$8.83	\$14.00	\$4.00	\$8.33
29	\$15.54	\$4.00	\$10.51	\$15.00	\$5.21	\$10.73	\$15.27	\$4.00	\$9.34
30	\$16.24	\$4.00	\$9.58	\$16.91	\$4.15	\$11.62	\$19.61	\$4.00	\$7.46
31	\$15.00	\$4.00	\$8.26	\$13.61	\$5.86	\$9.99	\$15.00	\$4.00	\$8.38
32	\$16.63	\$4.00	\$9.22	\$16.92	\$4.00	\$10.72	\$18.45	\$4.00	\$11.07
33	\$13.86	\$4.00	\$8.35	\$14.42	\$4.00	\$8.01	\$15.00	\$4.00	\$10.11
34	\$12.24	\$4.00	\$7.90	\$16.67	\$4.00	\$10.46	\$18.42	\$5.71	\$11.14
35	\$16.01	\$4.00	\$10.17	\$15.85	\$4.94	\$10.88	\$12.15	\$4.00	\$7.22
36	\$15.41	\$5.15	\$10.66	\$13.14	\$4.00	\$10.16	\$15.00	\$4.00	\$9.06
37	\$15.32	\$4.00	\$9.06	\$18.31	\$4.00	\$10.39	\$15.67	\$4.00	\$9.32
38	\$15.00	\$4.00	\$10.14	\$15.00	\$4.00	\$10.54	\$15.02	\$4.00	\$10.54
39	\$14.69	\$4.91	\$10.26	\$11.52	\$4.00	\$7.22	\$16.01	\$4.00	\$8.56
40	\$16.58	\$4.00	\$8.92	\$18.11	\$4.00	\$10.87	\$13.88	\$4.00	\$8.84
41	\$15.00	\$4.00	\$8.10	\$15.00	\$4.00	\$9.34	\$13.80	\$4.00	\$7.80
42	\$15.00	\$4.00	\$8.05	\$15.25	\$4.00	\$6.79	\$17.52	\$4.00	\$8.60
43	\$16.74	\$4.00	\$9.28	\$15.00	\$4.00	\$9.34	\$15.00	\$4.00	\$8.81
44	\$15.00	\$4.00	\$10.05	\$15.93	\$4.00	\$9.40	\$19.16	\$4.00	\$8.58
45	\$16.78	\$4.00	\$8.80	\$16.57	\$4.00	\$10.34	\$15.00	\$4.00	\$10.01
46	\$15.00	\$4.00	\$8.38	\$19.60	\$4.00	\$10.22	\$19.41	\$4.00	\$11.32
47	\$16.60	\$4.00	\$10.26	\$16.19	\$7.08	\$12.09	\$17.61	\$4.00	\$8.55
48	\$12.36	\$4.00	\$6.60	\$17.11	\$4.00	\$10.39	\$15.00	\$4.00	\$9.75
49	\$16.58	\$4.00	\$11.45	\$15.00	\$4.00	\$9.12	\$15.00	\$4.00	\$9.89
50	\$18.83	\$4.00	\$11.44	\$14.60	\$4.00	\$9.05	\$19.73	\$4.00	\$9.42
51	\$15.46	\$4.00	\$9.59	\$15.00	\$4.00	\$7.98	\$15.00	\$4.00	\$7.97
52	\$16.42	\$4.37	\$10.43	\$19.60	\$4.00	\$10.66	\$17.30	\$4.00	\$9.51

Nymex Detail-Annual Ranges

Draw	2024			2025			2026		
	max	min	avg	max	min	avg	max	min	avg
53	\$15.00	\$4.00	\$7.28	\$15.00	\$4.00	\$9.05	\$15.00	\$4.63	\$9.27
54	\$16.78	\$4.00	\$10.33	\$17.11	\$4.00	\$9.94	\$15.90	\$4.00	\$10.33
55	\$16.58	\$4.00	\$9.55	\$14.33	\$4.00	\$8.48	\$15.68	\$7.38	\$11.62
56	\$15.00	\$4.00	\$8.41	\$15.04	\$4.00	\$9.99	\$16.64	\$4.00	\$10.12
57	\$15.18	\$4.00	\$9.17	\$17.06	\$4.00	\$9.88	\$13.84	\$4.00	\$9.16
58	\$16.78	\$4.00	\$8.68	\$18.94	\$4.00	\$9.36	\$14.71	\$4.65	\$9.72
59	\$15.00	\$4.00	\$8.89	\$15.00	\$4.59	\$10.05	\$16.05	\$4.00	\$8.41
60	\$14.66	\$4.00	\$9.35	\$17.14	\$4.00	\$10.03	\$20.00	\$4.00	\$10.89
61	\$15.00	\$4.00	\$9.44	\$15.00	\$4.00	\$7.95	\$16.85	\$4.00	\$11.28
62	\$15.00	\$4.00	\$9.83	\$15.88	\$5.95	\$10.09	\$17.30	\$4.00	\$12.60
63	\$15.22	\$4.00	\$10.59	\$15.00	\$4.00	\$7.36	\$17.30	\$4.00	\$10.98
64	\$12.98	\$4.00	\$8.17	\$18.80	\$4.00	\$10.22	\$19.73	\$4.00	\$10.54
65	\$15.00	\$4.00	\$9.17	\$14.16	\$4.00	\$8.31	\$15.00	\$4.00	\$9.61
66	\$18.83	\$4.00	\$10.74	\$15.00	\$4.00	\$8.76	\$15.00	\$4.00	\$8.79
67	\$15.00	\$4.00	\$9.74	\$13.86	\$4.00	\$10.34	\$17.30	\$4.00	\$10.54
68	\$15.00	\$4.00	\$9.06	\$19.24	\$4.00	\$11.36	\$19.73	\$4.00	\$10.01
69	\$16.11	\$4.00	\$10.32	\$17.68	\$4.00	\$9.92	\$17.52	\$4.29	\$11.76
70	\$15.00	\$4.00	\$8.03	\$16.82	\$4.00	\$9.30	\$16.48	\$4.00	\$9.47
71	\$15.00	\$4.00	\$9.36	\$18.18	\$4.00	\$10.00	\$15.00	\$4.00	\$10.03
72	\$19.19	\$4.00	\$10.47	\$15.01	\$4.00	\$9.48	\$14.32	\$4.00	\$9.36
73	\$15.00	\$4.00	\$9.47	\$16.91	\$4.30	\$10.32	\$15.00	\$4.00	\$7.67
74	\$17.05	\$6.07	\$9.73	\$16.91	\$6.83	\$10.93	\$14.11	\$4.00	\$9.50
75	\$17.33	\$4.00	\$9.99	\$15.00	\$4.00	\$9.32	\$15.00	\$4.00	\$10.46
76	\$19.19	\$4.00	\$10.81	\$16.91	\$4.07	\$11.48	\$20.00	\$4.00	\$10.37
77	\$16.58	\$4.00	\$9.25	\$14.78	\$4.00	\$10.22	\$13.18	\$5.10	\$9.96
78	\$16.54	\$4.00	\$9.68	\$16.91	\$4.00	\$8.73	\$13.15	\$4.00	\$7.73
79	\$12.48	\$4.00	\$7.71	\$15.00	\$4.24	\$8.74	\$16.08	\$4.00	\$9.87
80	\$15.00	\$4.00	\$8.79	\$15.00	\$4.00	\$8.16	\$15.00	\$4.00	\$9.47
81	\$11.84	\$4.00	\$7.37	\$15.00	\$5.52	\$11.05	\$16.92	\$4.00	\$8.47
82	\$18.12	\$6.32	\$12.07	\$15.00	\$6.22	\$9.99	\$17.30	\$4.00	\$10.88
83	\$13.92	\$4.00	\$7.74	\$15.00	\$4.00	\$9.42	\$15.00	\$4.00	\$9.66
84	\$15.54	\$4.00	\$9.07	\$13.50	\$4.04	\$8.47	\$15.59	\$4.00	\$8.40
85	\$16.58	\$4.77	\$11.69	\$19.24	\$4.77	\$12.17	\$14.93	\$4.00	\$9.74
86	\$15.00	\$4.00	\$9.77	\$15.00	\$4.00	\$7.41	\$20.00	\$4.00	\$10.61
87	\$13.33	\$4.00	\$8.21	\$15.00	\$4.86	\$9.32	\$17.42	\$4.00	\$12.13
88	\$16.57	\$5.13	\$10.03	\$15.00	\$4.00	\$9.60	\$15.00	\$4.00	\$10.67
89	\$14.85	\$4.00	\$11.09	\$15.26	\$4.43	\$8.42	\$17.13	\$4.00	\$9.51
90	\$15.28	\$4.00	\$8.27	\$17.98	\$4.58	\$10.94	\$20.00	\$4.00	\$10.08
91	\$15.74	\$4.00	\$9.59	\$17.11	\$4.00	\$10.07	\$15.00	\$4.00	\$10.29
92	\$13.60	\$4.00	\$8.21	\$14.29	\$4.00	\$8.39	\$18.60	\$4.00	\$10.44
93	\$12.35	\$4.00	\$7.50	\$16.98	\$4.00	\$10.48	\$16.80	\$4.00	\$10.78
94	\$15.00	\$4.00	\$8.58	\$18.55	\$4.00	\$9.17	\$16.04	\$4.00	\$10.07
95	\$18.83	\$4.00	\$9.36	\$16.28	\$4.00	\$8.79	\$20.00	\$4.00	\$9.76
96	\$15.00	\$4.00	\$9.91	\$12.96	\$4.00	\$6.75	\$17.52	\$4.00	\$10.66
97	\$14.48	\$4.89	\$10.68	\$13.01	\$4.00	\$8.06	\$15.14	\$4.00	\$10.78
98	\$15.00	\$4.00	\$8.36	\$15.00	\$4.00	\$9.83	\$15.00	\$4.00	\$11.13
99	\$14.73	\$4.00	\$9.39	\$17.83	\$4.00	\$10.81	\$13.96	\$4.00	\$9.65
100	\$12.92	\$4.00	\$5.99	\$15.02	\$4.00	\$7.12	\$15.00	\$4.00	\$10.03
101	\$16.78	\$4.44	\$9.58	\$15.00	\$4.64	\$11.27	\$15.00	\$4.00	\$8.54
102	\$14.96	\$4.00	\$9.44	\$13.11	\$4.00	\$8.34	\$14.98	\$4.00	\$9.12
103	\$16.58	\$4.00	\$9.55	\$16.91	\$4.00	\$12.04	\$14.56	\$4.00	\$7.83
104	\$16.44	\$4.00	\$10.70	\$17.64	\$4.00	\$9.97	\$16.36	\$4.00	\$9.63

Nymex Detail-Annual Ranges

Draw	2024			2025			2026		
	max	min	avg	max	min	avg	max	min	avg
105	\$16.34	\$4.00	\$10.49	\$14.69	\$4.00	\$9.17	\$15.00	\$4.00	\$10.12
106	\$13.96	\$4.00	\$8.52	\$15.00	\$4.00	\$8.77	\$19.16	\$4.00	\$11.30
107	\$15.00	\$4.00	\$8.81	\$19.60	\$4.00	\$9.42	\$17.52	\$5.52	\$11.09
108	\$15.00	\$4.00	\$9.07	\$15.00	\$4.00	\$8.29	\$15.00	\$4.00	\$8.99
109	\$16.11	\$4.00	\$8.07	\$14.51	\$4.00	\$8.74	\$15.19	\$4.00	\$11.54
110	\$14.78	\$4.00	\$9.37	\$16.33	\$4.00	\$10.01	\$15.00	\$4.00	\$6.87
111	\$15.00	\$4.00	\$9.24	\$15.00	\$4.00	\$9.41	\$17.30	\$4.00	\$9.10
112	\$16.42	\$5.60	\$12.77	\$12.11	\$4.00	\$8.62	\$17.46	\$4.00	\$11.05
113	\$16.75	\$4.00	\$10.10	\$17.54	\$4.00	\$11.80	\$15.75	\$4.00	\$10.54
114	\$15.00	\$4.00	\$7.24	\$12.33	\$5.18	\$8.50	\$17.52	\$4.00	\$11.11
115	\$15.00	\$4.00	\$9.23	\$16.91	\$5.76	\$11.18	\$19.76	\$4.00	\$9.20
116	\$16.78	\$4.00	\$11.33	\$19.60	\$4.00	\$9.86	\$20.00	\$4.00	\$10.90
117	\$15.00	\$4.00	\$7.24	\$19.60	\$4.00	\$10.64	\$18.67	\$4.00	\$12.44
118	\$15.00	\$4.00	\$9.85	\$19.60	\$4.00	\$8.83	\$15.00	\$5.62	\$10.38
119	\$15.00	\$4.00	\$9.69	\$14.42	\$4.00	\$9.40	\$15.00	\$6.15	\$11.23
120	\$15.00	\$4.00	\$8.45	\$14.91	\$4.00	\$6.86	\$15.00	\$4.00	\$10.98
121	\$18.27	\$4.00	\$9.38	\$15.00	\$4.00	\$7.44	\$19.73	\$5.89	\$10.95
122	\$16.71	\$4.00	\$11.02	\$15.00	\$4.00	\$11.48	\$20.00	\$7.12	\$12.34
123	\$15.00	\$4.00	\$10.59	\$12.84	\$4.00	\$9.34	\$15.00	\$4.00	\$9.00
124	\$15.03	\$4.00	\$7.34	\$15.98	\$5.91	\$11.01	\$19.91	\$4.00	\$8.81
125	\$19.09	\$4.00	\$8.38	\$18.03	\$5.98	\$13.04	\$13.46	\$4.00	\$7.86
126	\$19.19	\$4.00	\$9.27	\$16.82	\$4.00	\$9.79	\$17.23	\$4.00	\$10.55
127	\$15.44	\$4.00	\$8.72	\$16.18	\$4.00	\$9.89	\$15.05	\$4.00	\$8.85
128	\$16.58	\$4.00	\$10.17	\$15.00	\$4.00	\$8.71	\$15.01	\$5.21	\$10.37
129	\$15.45	\$4.00	\$8.65	\$15.00	\$4.00	\$9.02	\$15.00	\$4.00	\$9.75
130	\$18.70	\$4.00	\$11.26	\$14.62	\$4.00	\$9.01	\$17.69	\$4.00	\$11.35
131	\$18.11	\$4.00	\$10.33	\$19.60	\$4.00	\$8.60	\$15.00	\$4.00	\$8.79
132	\$11.24	\$4.00	\$6.15	\$15.92	\$4.71	\$10.70	\$18.97	\$4.00	\$10.82
133	\$16.58	\$4.00	\$10.82	\$19.60	\$4.46	\$10.85	\$17.30	\$4.00	\$8.33
134	\$15.00	\$5.03	\$10.47	\$12.04	\$4.00	\$7.70	\$15.00	\$4.00	\$10.04
135	\$15.00	\$4.00	\$10.76	\$16.91	\$4.00	\$10.37	\$15.00	\$4.00	\$10.04
136	\$16.58	\$4.00	\$10.95	\$14.02	\$4.00	\$8.60	\$13.90	\$4.00	\$6.90
137	\$15.00	\$6.00	\$10.82	\$15.00	\$4.00	\$7.09	\$15.02	\$4.00	\$9.05
138	\$15.00	\$4.00	\$11.19	\$15.00	\$4.00	\$9.86	\$15.74	\$4.00	\$10.95
139	\$15.00	\$4.00	\$7.81	\$19.60	\$4.00	\$9.65	\$16.68	\$4.00	\$10.56
140	\$16.78	\$4.00	\$8.45	\$15.28	\$4.00	\$8.64	\$15.00	\$4.00	\$8.28
141	\$15.00	\$4.00	\$7.59	\$15.74	\$4.00	\$11.05	\$15.00	\$4.00	\$10.04
142	\$15.09	\$7.94	\$12.39	\$18.18	\$4.64	\$9.78	\$17.43	\$4.00	\$10.05
143	\$15.00	\$4.00	\$9.08	\$15.00	\$4.00	\$9.67	\$16.29	\$4.47	\$10.36
144	\$14.47	\$5.06	\$9.73	\$16.78	\$4.00	\$10.40	\$18.19	\$6.51	\$11.80
145	\$16.10	\$4.00	\$9.28	\$18.62	\$4.00	\$9.73	\$15.00	\$4.00	\$7.35
146	\$15.00	\$4.00	\$9.56	\$15.58	\$4.00	\$10.77	\$17.94	\$4.00	\$10.25
147	\$14.84	\$4.00	\$8.62	\$15.00	\$4.00	\$9.40	\$13.91	\$4.00	\$7.69
148	\$15.00	\$4.00	\$7.55	\$19.60	\$5.95	\$11.87	\$17.26	\$4.00	\$9.18
149	\$15.97	\$4.00	\$10.71	\$15.00	\$4.00	\$9.11	\$17.30	\$4.00	\$9.37
150	\$16.97	\$4.00	\$10.15	\$17.11	\$4.00	\$9.83	\$14.25	\$4.00	\$7.13
151	\$16.09	\$4.00	\$9.29	\$18.93	\$4.00	\$10.66	\$17.30	\$4.00	\$10.71
152	\$16.78	\$4.00	\$11.79	\$17.01	\$4.00	\$9.43	\$15.00	\$4.00	\$9.04
153	\$13.63	\$4.00	\$7.86	\$15.52	\$4.00	\$9.49	\$17.07	\$4.00	\$10.23
154	\$16.58	\$4.00	\$8.69	\$15.00	\$4.00	\$8.99	\$20.00	\$4.00	\$11.30
155	\$16.78	\$4.00	\$10.66	\$16.91	\$4.00	\$8.73	\$14.17	\$4.00	\$9.41
156	\$15.00	\$4.00	\$9.18	\$15.00	\$4.00	\$10.39	\$18.45	\$4.00	\$10.83

Nymex Detail-Annual Ranges

Draw	2024			2025			2026		
	max	min	avg	max	min	avg	max	min	avg
157	\$13.79	\$4.00	\$7.93	\$19.49	\$4.00	\$10.19	\$18.11	\$4.00	\$10.61
158	\$15.08	\$4.00	\$8.71	\$15.00	\$4.00	\$9.62	\$15.54	\$4.00	\$9.56
159	\$15.00	\$4.00	\$9.34	\$16.08	\$4.00	\$9.38	\$16.80	\$4.00	\$9.20
160	\$16.60	\$4.00	\$9.36	\$12.98	\$4.19	\$8.88	\$16.14	\$4.00	\$8.50
161	\$18.83	\$4.00	\$8.11	\$14.94	\$4.00	\$9.15	\$19.68	\$4.00	\$12.13
162	\$15.00	\$4.00	\$9.79	\$16.91	\$4.00	\$8.25	\$15.37	\$4.00	\$10.24
163	\$15.47	\$4.00	\$7.46	\$15.00	\$4.00	\$9.01	\$17.30	\$4.00	\$8.64
164	\$16.58	\$4.00	\$8.70	\$14.30	\$4.00	\$9.43	\$15.34	\$4.00	\$10.44
165	\$18.23	\$4.00	\$9.42	\$15.00	\$4.00	\$10.71	\$15.11	\$4.00	\$9.77
166	\$15.00	\$4.00	\$9.45	\$19.24	\$4.96	\$11.10	\$15.00	\$5.33	\$10.69
167	\$19.19	\$5.14	\$10.60	\$16.54	\$4.21	\$11.43	\$15.00	\$4.00	\$9.50
168	\$13.42	\$4.00	\$7.97	\$15.00	\$6.22	\$10.45	\$19.41	\$4.00	\$9.07
169	\$18.83	\$4.00	\$8.21	\$17.15	\$5.71	\$10.51	\$14.51	\$4.00	\$9.06
170	\$15.20	\$4.00	\$9.20	\$14.32	\$4.00	\$9.46	\$15.00	\$4.00	\$9.82
171	\$15.23	\$4.00	\$9.82	\$15.00	\$4.00	\$10.53	\$17.30	\$4.00	\$9.87
172	\$16.99	\$4.00	\$10.04	\$15.28	\$4.82	\$10.80	\$17.30	\$4.00	\$10.94
173	\$15.00	\$4.00	\$9.71	\$15.15	\$4.00	\$8.68	\$17.89	\$4.00	\$10.06
174	\$19.19	\$4.00	\$10.36	\$15.00	\$4.00	\$10.12	\$16.48	\$4.00	\$9.75
175	\$15.00	\$4.00	\$9.43	\$15.00	\$4.00	\$9.55	\$12.06	\$4.00	\$7.79
176	\$14.42	\$4.00	\$8.73	\$14.14	\$4.00	\$9.88	\$13.16	\$4.00	\$7.25
177	\$15.00	\$4.00	\$8.94	\$15.33	\$4.00	\$9.57	\$15.00	\$5.30	\$11.15
178	\$15.13	\$4.40	\$9.92	\$16.49	\$4.00	\$9.05	\$15.00	\$4.00	\$9.08
179	\$13.80	\$4.00	\$8.11	\$13.14	\$4.90	\$9.48	\$14.61	\$4.00	\$9.47
180	\$15.00	\$4.00	\$9.15	\$15.00	\$4.29	\$9.57	\$15.00	\$4.00	\$10.02
181	\$15.00	\$4.00	\$7.82	\$19.60	\$4.00	\$10.79	\$15.00	\$4.00	\$9.65
182	\$18.07	\$4.00	\$12.06	\$19.24	\$4.00	\$9.74	\$15.00	\$4.00	\$9.19
183	\$17.18	\$4.00	\$11.11	\$16.77	\$4.00	\$10.99	\$11.93	\$4.00	\$7.22
184	\$15.00	\$4.10	\$8.35	\$17.85	\$4.00	\$9.34	\$15.23	\$4.00	\$9.71
185	\$15.00	\$4.00	\$9.82	\$18.99	\$4.00	\$7.76	\$15.88	\$4.91	\$10.77
186	\$10.61	\$4.00	\$7.90	\$16.57	\$4.00	\$10.97	\$15.00	\$4.00	\$9.99
187	\$15.00	\$4.00	\$9.92	\$18.11	\$7.67	\$13.12	\$20.00	\$4.00	\$11.53
188	\$15.00	\$4.34	\$9.52	\$17.11	\$4.00	\$9.35	\$18.90	\$4.00	\$10.03
189	\$15.71	\$4.00	\$10.00	\$15.19	\$4.00	\$9.54	\$13.87	\$4.00	\$9.20
190	\$15.00	\$4.00	\$9.26	\$15.39	\$4.00	\$10.98	\$17.87	\$4.00	\$9.44
191	\$15.00	\$4.00	\$8.58	\$12.61	\$4.00	\$8.71	\$20.00	\$4.00	\$9.47
192	\$15.00	\$4.00	\$8.53	\$19.24	\$4.20	\$11.04	\$20.00	\$4.21	\$10.55
193	\$16.79	\$4.04	\$9.90	\$15.36	\$4.41	\$10.04	\$16.74	\$4.00	\$9.78
194	\$13.76	\$4.00	\$7.57	\$14.55	\$4.00	\$8.44	\$15.00	\$4.00	\$9.75
195	\$13.49	\$4.00	\$8.55	\$16.55	\$4.00	\$9.43	\$15.00	\$4.00	\$10.38
196	\$15.00	\$4.00	\$9.47	\$15.00	\$4.00	\$8.72	\$17.52	\$4.00	\$11.43
197	\$16.58	\$4.00	\$8.40	\$15.00	\$4.00	\$9.87	\$16.94	\$4.00	\$8.72
198	\$12.26	\$4.00	\$6.19	\$16.91	\$4.00	\$8.48	\$15.58	\$4.00	\$8.58
199	\$11.71	\$4.00	\$8.65	\$15.00	\$4.00	\$9.01	\$15.00	\$4.00	\$9.43
200	\$12.05	\$4.00	\$7.87	\$17.11	\$4.00	\$10.20	\$17.52	\$4.45	\$12.29
average	\$15.54	\$4.11	\$9.34	\$16.02	\$4.26	\$9.67	\$16.28	\$4.18	\$9.78
Max	\$19.19			\$19.60			\$20.00		
Avg			\$9.34			\$9.67			\$9.78
Min	\$4.00			\$4.00			\$4.00		
Range	15.19			15.60			16.00		

Nymex Detail-Annual Ranges

Draw	2027			2028		
	max	min	avg	max	min	avg
1	\$18.17	\$4.00	\$11.49	\$15.00	\$4.00	\$9.07
2	\$15.05	\$4.05	\$10.87	\$16.02	\$4.00	\$9.17
3	\$16.43	\$4.00	\$9.11	\$15.00	\$4.00	\$10.65
4	\$15.29	\$4.00	\$8.89	\$16.46	\$4.00	\$11.00
5	\$15.00	\$4.00	\$8.74	\$15.55	\$4.00	\$8.68
6	\$17.59	\$4.00	\$7.11	\$15.00	\$4.00	\$9.08
7	\$15.00	\$6.73	\$10.80	\$19.73	\$4.00	\$10.73
8	\$17.27	\$4.00	\$10.46	\$17.30	\$4.00	\$10.39
9	\$18.28	\$4.00	\$8.62	\$16.74	\$4.00	\$8.82
10	\$17.90	\$4.14	\$8.49	\$17.05	\$4.00	\$10.19
11	\$15.00	\$4.00	\$10.16	\$18.37	\$4.00	\$10.65
12	\$17.30	\$4.00	\$11.74	\$19.07	\$4.00	\$9.96
13	\$15.40	\$4.00	\$10.27	\$17.05	\$4.12	\$9.75
14	\$17.52	\$4.00	\$11.82	\$16.85	\$4.00	\$8.80
15	\$17.30	\$4.00	\$9.34	\$17.24	\$4.96	\$9.73
16	\$16.89	\$4.00	\$9.24	\$18.90	\$4.00	\$11.52
17	\$15.00	\$4.00	\$10.37	\$17.24	\$4.11	\$11.69
18	\$15.00	\$6.94	\$9.56	\$15.00	\$4.00	\$10.40
19	\$12.77	\$4.00	\$7.87	\$15.07	\$4.00	\$11.04
20	\$15.00	\$4.00	\$9.01	\$14.99	\$6.23	\$9.46
21	\$15.00	\$4.00	\$9.80	\$16.65	\$4.00	\$9.87
22	\$20.00	\$5.02	\$10.57	\$19.73	\$4.00	\$9.02
23	\$19.73	\$4.00	\$10.76	\$15.11	\$5.44	\$11.46
24	\$15.70	\$5.42	\$9.58	\$16.41	\$4.00	\$10.03
25	\$16.35	\$4.00	\$9.10	\$19.73	\$4.00	\$10.27
26	\$16.29	\$4.00	\$11.82	\$16.06	\$4.00	\$10.21
27	\$17.88	\$4.00	\$11.24	\$15.95	\$4.67	\$10.35
28	\$20.00	\$4.00	\$11.43	\$16.87	\$4.00	\$11.37
29	\$20.00	\$4.00	\$12.61	\$16.39	\$4.00	\$9.11
30	\$20.00	\$4.00	\$10.78	\$15.00	\$4.00	\$10.92
31	\$14.10	\$4.00	\$8.38	\$15.00	\$4.00	\$9.29
32	\$17.64	\$4.00	\$10.11	\$15.92	\$4.00	\$9.11
33	\$17.52	\$4.00	\$9.21	\$19.73	\$4.00	\$10.48
34	\$15.00	\$4.00	\$11.02	\$15.35	\$4.00	\$10.37
35	\$20.00	\$4.00	\$10.05	\$20.00	\$4.00	\$11.16
36	\$15.00	\$4.00	\$11.63	\$14.89	\$4.00	\$8.80
37	\$15.65	\$4.00	\$8.73	\$17.19	\$5.30	\$10.97
38	\$15.00	\$4.00	\$8.69	\$17.05	\$4.00	\$10.17
39	\$17.30	\$4.00	\$10.80	\$17.52	\$4.00	\$9.24
40	\$15.00	\$6.18	\$9.67	\$17.52	\$4.67	\$11.02
41	\$19.05	\$4.00	\$8.50	\$15.00	\$4.50	\$9.87
42	\$16.20	\$4.00	\$9.99	\$18.05	\$4.00	\$11.12
43	\$19.73	\$4.00	\$10.28	\$17.30	\$4.00	\$11.41
44	\$15.00	\$4.00	\$10.54	\$15.00	\$4.36	\$8.89
45	\$16.53	\$4.00	\$10.22	\$11.17	\$4.00	\$7.87
46	\$15.00	\$5.62	\$10.22	\$15.00	\$6.51	\$9.34
47	\$15.00	\$4.00	\$8.58	\$17.30	\$4.00	\$8.55
48	\$20.00	\$4.00	\$10.58	\$17.30	\$4.00	\$9.35
49	\$15.00	\$4.00	\$10.52	\$19.42	\$4.00	\$11.53
50	\$13.57	\$4.79	\$10.72	\$15.57	\$4.22	\$9.50
51	\$17.52	\$5.56	\$11.10	\$18.34	\$4.00	\$11.23
52	\$18.70	\$4.00	\$10.71	\$20.00	\$4.00	\$13.21

Nymex Detail-Annual Ranges

Draw	2027			2028		
	max	min	avg	max	min	avg
53	\$20.00	\$4.57	\$10.77	\$14.38	\$4.00	\$9.64
54	\$15.32	\$5.99	\$11.70	\$17.02	\$4.00	\$9.32
55	\$20.00	\$4.00	\$9.22	\$17.52	\$4.00	\$11.28
56	\$19.51	\$4.00	\$10.30	\$15.00	\$5.55	\$11.33
57	\$15.00	\$4.00	\$9.41	\$18.74	\$4.63	\$13.34
58	\$14.81	\$4.00	\$8.71	\$14.12	\$4.00	\$8.24
59	\$16.96	\$4.06	\$11.62	\$15.00	\$4.00	\$9.32
60	\$17.52	\$4.00	\$10.50	\$15.00	\$4.00	\$8.74
61	\$16.42	\$4.10	\$10.96	\$17.30	\$4.00	\$9.09
62	\$14.71	\$4.00	\$8.21	\$14.82	\$4.00	\$6.85
63	\$18.57	\$7.10	\$12.03	\$15.00	\$4.00	\$10.30
64	\$15.74	\$4.00	\$8.57	\$15.00	\$4.00	\$10.02
65	\$16.18	\$4.00	\$10.25	\$16.60	\$4.00	\$10.16
66	\$17.87	\$4.00	\$9.87	\$15.64	\$4.00	\$8.88
67	\$17.52	\$4.00	\$10.53	\$15.00	\$4.00	\$8.32
68	\$15.00	\$4.00	\$10.46	\$17.75	\$4.00	\$9.78
69	\$16.20	\$4.00	\$9.82	\$15.63	\$4.01	\$10.50
70	\$17.88	\$4.00	\$9.62	\$15.00	\$4.00	\$10.01
71	\$15.00	\$4.00	\$9.47	\$15.69	\$4.00	\$9.78
72	\$17.30	\$4.00	\$10.17	\$17.30	\$4.00	\$9.96
73	\$13.99	\$4.00	\$8.81	\$16.02	\$4.00	\$10.12
74	\$15.12	\$4.00	\$9.42	\$17.85	\$4.00	\$11.65
75	\$19.73	\$4.00	\$9.73	\$19.73	\$4.00	\$9.82
76	\$17.52	\$4.00	\$11.56	\$15.00	\$4.00	\$11.03
77	\$15.00	\$4.00	\$8.69	\$16.81	\$4.00	\$9.89
78	\$19.03	\$4.00	\$11.17	\$20.00	\$5.18	\$10.72
79	\$16.48	\$4.00	\$10.78	\$16.99	\$4.00	\$9.91
80	\$20.00	\$4.00	\$9.72	\$15.29	\$4.00	\$8.45
81	\$14.79	\$4.00	\$7.91	\$15.00	\$4.00	\$8.74
82	\$15.75	\$4.00	\$11.41	\$15.00	\$4.11	\$9.74
83	\$16.30	\$4.00	\$9.06	\$17.52	\$4.00	\$10.79
84	\$17.48	\$4.00	\$10.50	\$17.18	\$4.00	\$9.62
85	\$20.00	\$4.00	\$9.26	\$17.52	\$4.00	\$10.93
86	\$17.49	\$4.00	\$11.85	\$15.91	\$4.00	\$9.57
87	\$15.00	\$4.00	\$8.21	\$15.00	\$4.67	\$10.43
88	\$16.18	\$4.00	\$10.56	\$16.76	\$4.00	\$10.76
89	\$15.00	\$4.00	\$10.56	\$15.00	\$4.00	\$8.94
90	\$20.00	\$4.00	\$13.15	\$19.73	\$8.46	\$12.23
91	\$17.30	\$4.00	\$8.00	\$17.51	\$4.00	\$10.77
92	\$15.00	\$4.00	\$8.79	\$16.13	\$4.00	\$10.85
93	\$17.30	\$4.00	\$10.39	\$19.73	\$4.13	\$10.96
94	\$20.00	\$4.00	\$10.79	\$15.00	\$4.00	\$9.32
95	\$15.00	\$4.00	\$8.63	\$17.52	\$4.00	\$10.47
96	\$13.68	\$4.00	\$7.69	\$17.48	\$4.00	\$10.36
97	\$18.06	\$4.00	\$12.03	\$17.52	\$4.00	\$9.00
98	\$16.09	\$4.00	\$10.65	\$15.76	\$4.00	\$9.91
99	\$15.00	\$4.00	\$10.67	\$19.73	\$4.00	\$8.88
100	\$15.92	\$4.00	\$8.68	\$15.00	\$4.00	\$8.89
101	\$14.83	\$5.35	\$10.54	\$17.30	\$4.00	\$9.74
102	\$17.52	\$4.00	\$10.56	\$15.10	\$8.08	\$12.31
103	\$15.00	\$4.00	\$9.46	\$20.00	\$4.00	\$12.38
104	\$17.30	\$4.00	\$10.09	\$14.93	\$4.00	\$9.45

Nymex Detail-Annual Ranges

Draw	2027			2028		
	max	min	avg	max	min	avg
105	\$15.45	\$4.00	\$10.46	\$15.83	\$4.00	\$8.47
106	\$20.00	\$4.00	\$10.69	\$16.12	\$4.00	\$10.94
107	\$15.00	\$4.00	\$11.14	\$17.52	\$4.00	\$12.07
108	\$17.52	\$4.00	\$8.23	\$19.58	\$4.00	\$10.65
109	\$15.00	\$4.00	\$9.02	\$16.31	\$4.00	\$9.64
110	\$15.00	\$4.00	\$9.96	\$15.29	\$4.00	\$11.54
111	\$15.00	\$4.00	\$10.24	\$18.95	\$5.41	\$11.86
112	\$15.00	\$4.00	\$7.87	\$15.00	\$4.00	\$7.97
113	\$15.09	\$4.00	\$9.78	\$18.61	\$4.00	\$10.76
114	\$17.30	\$4.00	\$11.94	\$16.38	\$4.00	\$9.80
115	\$15.00	\$4.00	\$9.18	\$16.50	\$4.00	\$11.05
116	\$13.88	\$4.00	\$9.18	\$15.00	\$4.00	\$8.36
117	\$15.00	\$4.00	\$10.69	\$17.30	\$4.00	\$10.69
118	\$20.00	\$4.00	\$11.31	\$16.68	\$4.00	\$11.73
119	\$20.00	\$4.04	\$10.32	\$19.36	\$4.00	\$10.72
120	\$17.52	\$4.00	\$10.33	\$15.00	\$4.00	\$9.88
121	\$17.52	\$4.00	\$10.32	\$15.00	\$4.00	\$10.65
122	\$16.20	\$4.00	\$10.68	\$15.00	\$4.00	\$11.70
123	\$13.77	\$4.00	\$7.46	\$20.00	\$4.00	\$12.43
124	\$15.00	\$4.00	\$11.23	\$15.00	\$4.00	\$10.96
125	\$15.00	\$4.00	\$9.43	\$19.73	\$4.00	\$9.79
126	\$17.52	\$4.00	\$9.55	\$17.54	\$6.06	\$10.86
127	\$16.35	\$4.00	\$9.91	\$17.43	\$4.67	\$10.97
128	\$15.55	\$4.00	\$10.41	\$19.39	\$4.00	\$9.28
129	\$15.00	\$4.00	\$9.33	\$15.00	\$4.00	\$10.21
130	\$15.94	\$4.00	\$9.45	\$20.00	\$5.27	\$10.35
131	\$15.00	\$4.00	\$10.20	\$15.00	\$4.00	\$9.44
132	\$17.52	\$4.00	\$11.75	\$17.52	\$4.00	\$10.29
133	\$20.00	\$4.00	\$10.65	\$12.11	\$4.00	\$9.40
134	\$15.00	\$4.00	\$9.18	\$17.28	\$4.00	\$11.08
135	\$18.41	\$4.00	\$9.92	\$15.00	\$4.00	\$9.01
136	\$19.73	\$4.00	\$9.97	\$18.46	\$4.00	\$10.60
137	\$15.00	\$4.00	\$8.62	\$15.00	\$4.00	\$7.78
138	\$16.66	\$4.64	\$10.99	\$15.94	\$8.33	\$11.49
139	\$16.38	\$4.00	\$9.48	\$20.00	\$4.00	\$10.93
140	\$13.12	\$6.47	\$9.12	\$17.30	\$6.62	\$12.99
141	\$15.00	\$4.00	\$9.67	\$17.52	\$4.00	\$11.55
142	\$16.34	\$4.00	\$12.22	\$15.39	\$4.00	\$11.09
143	\$15.00	\$4.00	\$8.62	\$15.35	\$4.00	\$10.02
144	\$14.17	\$4.00	\$8.67	\$14.50	\$4.00	\$8.41
145	\$15.00	\$4.00	\$9.33	\$16.14	\$4.00	\$8.87
146	\$18.52	\$4.00	\$11.65	\$15.87	\$4.00	\$9.13
147	\$17.52	\$4.00	\$8.90	\$15.00	\$4.00	\$8.74
148	\$11.62	\$4.00	\$7.15	\$17.30	\$4.00	\$10.24
149	\$15.00	\$4.00	\$9.26	\$17.30	\$4.00	\$9.01
150	\$16.97	\$4.00	\$9.80	\$15.00	\$4.00	\$10.79
151	\$16.03	\$4.09	\$10.08	\$17.52	\$4.00	\$10.74
152	\$19.16	\$4.00	\$10.13	\$14.87	\$4.00	\$9.75
153	\$17.30	\$4.04	\$9.75	\$15.76	\$5.80	\$11.22
154	\$15.85	\$4.00	\$10.25	\$15.00	\$4.10	\$11.36
155	\$19.47	\$4.00	\$10.18	\$15.00	\$4.00	\$8.90
156	\$13.66	\$4.00	\$6.52	\$14.89	\$4.00	\$9.27

Nymex Detail-Annual Ranges

Draw	2027			2028		
	max	min	avg	max	min	avg
157	\$14.50	\$4.00	\$8.85	\$16.11	\$4.00	\$10.12
158	\$15.00	\$4.00	\$9.02	\$15.25	\$4.00	\$10.81
159	\$15.03	\$4.00	\$9.98	\$16.81	\$4.00	\$11.62
160	\$19.73	\$4.00	\$11.01	\$16.75	\$6.29	\$11.79
161	\$15.51	\$4.72	\$11.43	\$18.55	\$4.00	\$9.24
162	\$15.30	\$4.00	\$10.42	\$17.63	\$4.14	\$11.62
163	\$15.00	\$4.00	\$9.96	\$15.83	\$4.00	\$9.34
164	\$15.00	\$4.00	\$8.49	\$17.30	\$4.00	\$10.07
165	\$15.53	\$4.00	\$9.23	\$16.43	\$4.00	\$11.18
166	\$17.52	\$6.45	\$11.58	\$15.00	\$4.00	\$9.84
167	\$15.00	\$4.00	\$8.84	\$15.94	\$4.00	\$10.79
168	\$18.79	\$4.00	\$9.56	\$20.00	\$7.20	\$12.62
169	\$15.00	\$4.00	\$9.82	\$16.12	\$4.00	\$9.10
170	\$15.85	\$4.00	\$10.61	\$19.30	\$4.00	\$8.62
171	\$17.52	\$4.00	\$10.44	\$16.06	\$4.75	\$11.80
172	\$17.52	\$4.00	\$8.93	\$17.87	\$4.77	\$10.93
173	\$16.97	\$4.87	\$9.89	\$16.61	\$4.00	\$11.26
174	\$15.00	\$4.00	\$7.88	\$15.00	\$4.00	\$9.61
175	\$15.00	\$4.00	\$10.76	\$17.30	\$4.00	\$9.53
176	\$17.39	\$4.00	\$7.48	\$15.00	\$4.00	\$9.98
177	\$15.75	\$4.00	\$8.55	\$13.21	\$4.00	\$9.11
178	\$15.00	\$4.00	\$10.28	\$15.00	\$4.00	\$10.40
179	\$19.73	\$4.00	\$10.94	\$17.03	\$5.54	\$10.22
180	\$17.25	\$4.00	\$11.47	\$16.84	\$7.34	\$11.32
181	\$16.39	\$4.93	\$10.56	\$17.52	\$4.00	\$11.88
182	\$18.27	\$4.00	\$10.52	\$15.00	\$4.00	\$10.67
183	\$19.64	\$4.00	\$10.46	\$13.33	\$4.00	\$6.81
184	\$16.17	\$4.00	\$10.04	\$16.89	\$4.90	\$10.56
185	\$15.00	\$5.03	\$10.06	\$15.00	\$4.00	\$9.18
186	\$15.00	\$4.00	\$9.88	\$17.35	\$4.00	\$9.15
187	\$15.57	\$4.00	\$9.53	\$17.30	\$4.00	\$10.40
188	\$16.35	\$4.00	\$9.77	\$17.72	\$4.00	\$8.44
189	\$15.00	\$4.00	\$9.32	\$16.27	\$4.28	\$10.47
190	\$15.00	\$4.00	\$9.93	\$15.00	\$4.00	\$9.31
191	\$19.27	\$4.00	\$9.90	\$17.52	\$4.00	\$10.18
192	\$15.00	\$4.00	\$10.34	\$20.00	\$4.00	\$11.52
193	\$18.28	\$4.00	\$11.01	\$17.30	\$4.00	\$10.97
194	\$17.52	\$4.00	\$11.09	\$17.59	\$4.00	\$11.03
195	\$16.45	\$4.00	\$9.46	\$18.87	\$6.69	\$11.91
196	\$15.00	\$4.60	\$9.49	\$18.50	\$4.00	\$11.49
197	\$19.73	\$4.00	\$9.57	\$15.00	\$4.00	\$10.13
198	\$19.21	\$4.00	\$10.15	\$15.01	\$5.82	\$10.44
199	\$15.00	\$4.00	\$9.75	\$16.24	\$4.00	\$10.62
200	\$19.42	\$4.00	\$11.37	\$16.64	\$4.00	\$9.09
average	\$16.54	\$4.16	\$9.96	\$16.60	\$4.28	\$10.19
Max	\$20.00			\$20.00		
Avg			\$9.96			\$10.19
Min	\$4.00			\$4.00		
Range	16.00			16.00		

Appendix H

Avoided Cost Calculations

**CASCADE NATURAL GAS CORPORATION
INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - AVERAGE WEATHER
45 YEAR RESOURCE SUMMARY COSTS - MELDED COST PER THERM**

YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	PORTFOLIO COSTS WITH 10% CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2009	1	\$ 0.87	\$ 0.94	\$ 0.87	\$0.96	
2010	2	\$ 0.75	\$ 0.87	-7.79%	\$ 1.62	\$1.78
2011	3	\$ 0.73	\$ 0.91	5.05%	\$ 2.35	\$2.58
2012	4	\$ 0.70	\$ 0.94	3.32%	\$ 3.05	\$3.35
2013	5	\$ 0.66	\$ 0.95	1.42%	\$ 3.71	\$4.08
2014	6	\$ 0.62	\$ 0.97	1.68%	\$ 4.33	\$4.76
2015	7	\$ 0.57	\$ 0.95	-2.14%	\$ 4.90	\$5.39
2016	8	\$ 0.53	\$ 0.96	1.32%	\$ 5.43	\$5.97
2017	9	\$ 0.50	\$ 0.97	0.65%	\$ 5.93	\$6.52
2018	10	\$ 0.47	\$ 0.97	0.61%	\$ 6.40	\$7.03
2019	11	\$ 0.44	\$ 0.98	0.93%	\$ 6.83	\$7.52
2020	12	\$ 0.41	\$ 0.98	0.21%	\$ 7.24	\$7.96
2021	13	\$ 0.37	\$ 0.96	-2.35%	\$ 7.61	\$8.37
2022	14	\$ 0.34	\$ 0.97	0.54%	\$ 7.95	\$8.75
2023	15	\$ 0.33	\$ 0.99	2.51%	\$ 8.28	\$9.11
2024	16	\$ 0.31	\$ 1.01	2.50%	\$ 8.59	\$9.45
2025	17	\$ 0.30	\$ 1.05	3.94%	\$ 8.90	\$9.79
2026	18	\$ 0.28	\$ 1.05	-0.21%	\$ 9.18	\$10.09
2027	19	\$ 0.27	\$ 1.10	4.77%	\$ 9.45	\$10.39
2028	20	\$ 0.29	\$ 1.27	14.93%	\$ 9.74	\$10.71
2029	21	\$ 0.27	\$ 1.30	2.60%	\$ 10.02	\$11.02
2030	22	\$ 0.26	\$ 1.33	2.60%	\$ 10.28	\$11.31
2031	23	\$ 0.25	\$ 1.37	2.60%	\$ 10.54	\$11.59
2032	24	\$ 0.24	\$ 1.40	2.60%	\$ 10.78	\$11.85
2033	25	\$ 0.23	\$ 1.44	2.60%	\$ 11.00	\$12.11
2034	26	\$ 0.22	\$ 1.48	2.60%	\$ 11.22	\$12.35
2035	27	\$ 0.21	\$ 1.52	2.60%	\$ 11.43	\$12.57
2036	28	\$ 0.20	\$ 1.56	2.60%	\$ 11.63	\$12.79
2037	29	\$ 0.19	\$ 1.60	2.60%	\$ 11.82	\$13.00
2038	30	\$ 0.18	\$ 1.64	2.60%	\$ 12.00	\$13.20
2039	31	\$ 0.17	\$ 1.68	2.60%	\$ 12.17	\$13.39
2040	32	\$ 0.16	\$ 1.72	2.60%	\$ 12.34	\$13.57
2041	33	\$ 0.16	\$ 1.77	2.60%	\$ 12.49	\$13.74
2042	34	\$ 0.15	\$ 1.82	2.60%	\$ 12.64	\$13.90
2043	35	\$ 0.14	\$ 1.86	2.60%	\$ 12.78	\$14.06
2044	36	\$ 0.14	\$ 1.91	2.60%	\$ 12.92	\$14.21
2045	37	\$ 0.13	\$ 1.96	2.60%	\$ 13.05	\$14.35
2046	38	\$ 0.12	\$ 2.01	2.60%	\$ 13.17	\$14.49
2047	39	\$ 0.12	\$ 2.06	2.60%	\$ 13.29	\$14.62
2048	40	\$ 0.11	\$ 2.12	2.60%	\$ 13.40	\$14.74
2049	41	\$ 0.11	\$ 2.17	2.60%	\$ 13.51	\$14.86
2050	42	\$ 0.10	\$ 2.23	2.60%	\$ 13.61	\$14.97
2051	43	\$ 0.10	\$ 2.29	2.60%	\$ 13.70	\$15.07
2052	44	\$ 0.09	\$ 2.35	2.60%	\$ 13.80	\$15.18
2053	45	\$ 0.09	\$ 2.41	2.60%	\$ 13.88	\$15.27

Cascade's Long Term Real Discount Rate: 4.170%
 IRP Discount Rate = 7.631%
 Revised Discount Rate= 7.631%
 Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

**CASCADE NATURAL GAS CORPORATION
INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - ENVIRONMENTAL EXTERNALITY SCENARIO 1
45 YEAR RESOURCE SUMMARY COSTS - MELED COST PER THERM**

YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	PORTFOLIO COSTS WITH 10% CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2009	1	\$ 0.83	\$ 0.90	\$ 0.83	\$0.92	
2010	2	\$ 0.84	\$ 0.97	8.41%	\$1.84	
2011	3	\$ 0.83	\$ 1.04	6.57%	\$2.76	
2012	4	\$ 0.87	\$ 1.16	11.99%	\$3.71	
2013	5	\$ 0.84	\$ 1.21	4.15%	\$4.63	
2014	6	\$ 0.81	\$ 1.27	4.58%	\$5.53	
2015	7	\$ 0.75	\$ 1.26	-0.62%	\$6.36	\$1.0946
2016	8	\$ 0.70	\$ 1.26	-0.01%	\$7.13	
2017	9	\$ 0.65	\$ 1.26	0.16%	\$7.84	
2018	10	\$ 0.61	\$ 1.26	0.27%	\$8.51	\$1.0964
2019	11	\$ 0.57	\$ 1.27	0.51%	\$9.13	
2020	12	\$ 0.53	\$ 1.27	0.13%	\$9.71	
2021	13	\$ 0.48	\$ 1.24	-2.26%	\$10.23	
2022	14	\$ 0.44	\$ 1.25	0.16%	\$10.72	
2023	15	\$ 0.42	\$ 1.27	1.77%	\$11.19	
2024	16	\$ 0.40	\$ 1.29	1.99%	\$11.62	
2025	17	\$ 0.38	\$ 1.33	3.23%	\$12.04	
2026	18	\$ 0.35	\$ 1.33	-0.43%	\$12.43	
2027	19	\$ 0.34	\$ 1.38	3.99%	\$12.81	
2028	20	\$ 0.36	\$ 1.55	12.24%	\$13.20	\$1.0503
2029	21	\$ 0.34	\$ 1.59	2.60%	\$13.57	
2030	22	\$ 0.32	\$ 1.63	2.60%	\$13.93	
2031	23	\$ 0.31	\$ 1.67	2.60%	\$14.27	
2032	24	\$ 0.29	\$ 1.72	2.60%	\$14.59	
2033	25	\$ 0.28	\$ 1.76	2.60%	\$14.90	
2034	26	\$ 0.27	\$ 1.81	2.60%	\$15.20	
2035	27	\$ 0.25	\$ 1.86	2.60%	\$15.48	
2036	28	\$ 0.24	\$ 1.90	2.60%	\$15.74	
2037	29	\$ 0.23	\$ 1.95	2.60%	\$16.00	
2038	30	\$ 0.22	\$ 2.00	2.60%	\$16.24	\$1.0445
2039	31	\$ 0.21	\$ 2.06	2.60%	\$16.47	
2040	32	\$ 0.20	\$ 2.11	2.60%	\$16.69	
2041	33	\$ 0.19	\$ 2.16	2.60%	\$16.90	
2042	34	\$ 0.18	\$ 2.22	2.60%	\$17.10	
2043	35	\$ 0.17	\$ 2.28	2.60%	\$17.29	\$1.0429
2044	36	\$ 0.17	\$ 2.34	2.60%	\$17.48	
2045	37	\$ 0.16	\$ 2.40	2.60%	\$17.65	
2046	38	\$ 0.15	\$ 2.46	2.60%	\$17.82	
2047	39	\$ 0.14	\$ 2.53	2.60%	\$17.97	
2048	40	\$ 0.14	\$ 2.59	2.60%	\$18.12	\$1.0418
2049	41	\$ 0.13	\$ 2.66	2.60%	\$18.27	
2050	42	\$ 0.12	\$ 2.73	2.60%	\$18.40	
2051	43	\$ 0.12	\$ 2.80	2.60%	\$18.53	
2052	44	\$ 0.11	\$ 2.87	2.60%	\$18.66	
2053	45	\$ 0.11	\$ 2.95	2.60%	\$18.78	\$1.0410

Cascade's Long Term Real Discount Rate: 4.170%
 IRP Discount Rate = 7.631%
 Revised Discount Rate= 7.631%
 Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

**CASCADE NATURAL GAS CORPORATION
INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - ENVIRONMENTAL EXTERNALITY SCENARIO 2
45 YEAR RESOURCE SUMMARY COSTS - MELED COST PER THERM**

YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	PORTFOLIO COSTS WITH 10% CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2009	1	\$ 0.87	\$ 0.94	\$ 0.87	\$0.96	
2010	2	\$ 0.75	\$ 0.87	-7.79%	\$ 1.62	\$1.78
2011	3	\$ 0.73	\$ 0.91	5.11%	\$ 2.35	\$2.58
2012	4	\$ 0.79	\$ 1.06	17.05%	\$ 3.14	\$3.46
2013	5	\$ 0.80	\$ 1.15	8.15%	\$ 3.94	\$4.33
2014	6	\$ 0.80	\$ 1.25	8.63%	\$ 4.74	\$5.22
2015	7	\$ 0.79	\$ 1.32	5.65%	\$ 5.53	\$6.09
2016	8	\$ 0.80	\$ 1.44	8.78%	\$ 6.33	\$6.97
2017	9	\$ 0.76	\$ 1.47	2.52%	\$ 7.09	\$7.80
2018	10	\$ 0.72	\$ 1.51	2.54%	\$ 7.82	\$8.60
2019	11	\$ 0.69	\$ 1.55	2.83%	\$ 8.51	\$9.36
2020	12	\$ 0.66	\$ 1.59	2.20%	\$ 9.17	\$10.08
2021	13	\$ 0.62	\$ 1.60	0.99%	\$ 9.78	\$10.76
2022	14	\$ 0.59	\$ 1.65	2.70%	\$ 10.37	\$11.41
2023	15	\$ 0.57	\$ 1.71	4.00%	\$ 10.94	\$12.03
2024	16	\$ 0.55	\$ 1.78	3.92%	\$ 11.49	\$12.64
2025	17	\$ 0.56	\$ 1.95	9.57%	\$ 12.05	\$13.25
2026	18	\$ 0.54	\$ 2.04	4.33%	\$ 12.59	\$13.85
2027	19	\$ 0.50	\$ 2.02	-0.69%	\$ 13.09	\$14.40
2028	20	\$ 0.52	\$ 2.24	11.04%	\$ 13.60	\$14.97
2029	21	\$ 0.49	\$ 2.30	2.60%	\$ 14.10	\$15.51
2030	22	\$ 0.47	\$ 2.36	2.60%	\$ 14.56	\$16.02
2031	23	\$ 0.45	\$ 2.42	2.60%	\$ 15.01	\$16.51
2032	24	\$ 0.43	\$ 2.49	2.60%	\$ 15.44	\$16.98
2033	25	\$ 0.41	\$ 2.55	2.60%	\$ 15.84	\$17.43
2034	26	\$ 0.39	\$ 2.62	2.60%	\$ 16.23	\$17.85
2035	27	\$ 0.37	\$ 2.69	2.60%	\$ 16.60	\$18.26
2036	28	\$ 0.35	\$ 2.76	2.60%	\$ 16.95	\$18.65
2037	29	\$ 0.34	\$ 2.83	2.60%	\$ 17.29	\$19.01
2038	30	\$ 0.32	\$ 2.90	2.60%	\$ 17.61	\$19.37
2039	31	\$ 0.30	\$ 2.98	2.60%	\$ 17.91	\$19.70
2040	32	\$ 0.29	\$ 3.05	2.60%	\$ 18.20	\$20.02
2041	33	\$ 0.28	\$ 3.13	2.60%	\$ 18.48	\$20.32
2042	34	\$ 0.26	\$ 3.22	2.60%	\$ 18.74	\$20.61
2043	35	\$ 0.25	\$ 3.30	2.60%	\$ 18.99	\$20.89
2044	36	\$ 0.24	\$ 3.38	2.60%	\$ 19.23	\$21.16
2045	37	\$ 0.23	\$ 3.47	2.60%	\$ 19.46	\$21.41
2046	38	\$ 0.22	\$ 3.56	2.60%	\$ 19.68	\$21.65
2047	39	\$ 0.21	\$ 3.66	2.60%	\$ 19.89	\$21.87
2048	40	\$ 0.20	\$ 3.75	2.60%	\$ 20.08	\$22.09
2049	41	\$ 0.19	\$ 3.85	2.60%	\$ 20.27	\$22.30
2050	42	\$ 0.18	\$ 3.95	2.60%	\$ 20.45	\$22.50
2051	43	\$ 0.17	\$ 4.05	2.60%	\$ 20.62	\$22.69
2052	44	\$ 0.16	\$ 4.16	2.60%	\$ 20.79	\$22.87
2053	45	\$ 0.16	\$ 4.26	2.60%	\$ 20.94	\$23.04

Cascade's Long Term Real Discount Rate: 4.170%
 IRP Discount Rate = 7.631%
 Revised Discount Rate= 7.631%
 Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

**CASCADE NATURAL GAS CORPORATION
INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - ENVIRONMENTAL EXTERNALITY SCENARIO 3
45 YEAR RESOURCE SUMMARY COSTS - MELED COST PER THERM**

YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	PORTFOLIO COSTS WITH 10% CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2009	1	\$ 0.87	\$ 0.94	\$ 0.87	\$0.96	
2010	2	\$ 0.75	\$ 0.87	\$ -7.79%	\$1.78	
2011	3	\$ 0.73	\$ 0.91	\$ 5.11%	\$2.58	
2012	4	\$ 0.70	\$ 0.94	\$ 3.62%	\$3.36	
2013	5	\$ 0.66	\$ 0.96	\$ 1.40%	\$4.08	
2014	6	\$ 0.63	\$ 0.97	\$ 1.76%	\$4.77	
2015	7	\$ 0.57	\$ 0.95	\$ -2.33%	\$5.40	\$0.9047
2016	8	\$ 0.53	\$ 0.96	\$ 1.39%	\$5.98	
2017	9	\$ 0.63	\$ 1.23	\$ 27.44%	\$6.68	
2018	10	\$ 0.67	\$ 1.39	\$ 13.08%	\$7.41	\$0.9216
2019	11	\$ 0.70	\$ 1.57	\$ 13.22%	\$8.18	
2020	12	\$ 0.73	\$ 1.77	\$ 12.48%	\$8.99	
2021	13	\$ 0.76	\$ 1.96	\$ 11.16%	\$9.82	
2022	14	\$ 0.73	\$ 2.04	\$ 3.60%	\$10.62	
2023	15	\$ 0.71	\$ 2.13	\$ 4.69%	\$11.39	
2024	16	\$ 0.69	\$ 2.23	\$ 4.65%	\$12.15	
2025	17	\$ 0.70	\$ 2.43	\$ 9.18%	\$12.92	
2026	18	\$ 0.68	\$ 2.56	\$ 4.99%	\$13.67	
2027	19	\$ 0.64	\$ 2.58	\$ 1.01%	\$14.37	
2028	20	\$ 0.65	\$ 2.85	\$ 10.30%	\$15.09	\$1.1270
2029	21	\$ 0.62	\$ 2.92	\$ 2.60%	\$15.77	
2030	22	\$ 0.59	\$ 3.00	\$ 2.60%	\$16.43	
2031	23	\$ 0.57	\$ 3.08	\$ 2.60%	\$17.05	
2032	24	\$ 0.54	\$ 3.16	\$ 2.60%	\$17.65	
2033	25	\$ 0.52	\$ 3.24	\$ 2.60%	\$18.21	
2034	26	\$ 0.49	\$ 3.32	\$ 2.60%	\$18.75	
2035	27	\$ 0.47	\$ 3.41	\$ 2.60%	\$19.27	
2036	28	\$ 0.45	\$ 3.50	\$ 2.60%	\$19.76	
2037	29	\$ 0.43	\$ 3.59	\$ 2.60%	\$20.22	
2038	30	\$ 0.41	\$ 3.68	\$ 2.60%	\$20.67	\$1.2202
2039	31	\$ 0.39	\$ 3.78	\$ 2.60%	\$21.10	
2040	32	\$ 0.37	\$ 3.87	\$ 2.60%	\$21.50	
2041	33	\$ 0.35	\$ 3.98	\$ 2.60%	\$21.89	
2042	34	\$ 0.33	\$ 4.08	\$ 2.60%	\$22.26	
2043	35	\$ 0.32	\$ 4.18	\$ 2.60%	\$22.61	\$1.2393
2044	36	\$ 0.30	\$ 4.29	\$ 2.60%	\$22.94	
2045	37	\$ 0.29	\$ 4.41	\$ 2.60%	\$23.26	
2046	38	\$ 0.28	\$ 4.52	\$ 2.60%	\$23.56	
2047	39	\$ 0.26	\$ 4.64	\$ 2.60%	\$23.85	
2048	40	\$ 0.25	\$ 4.76	\$ 2.60%	\$24.13	\$1.2501
2049	41	\$ 0.24	\$ 4.88	\$ 2.60%	\$24.39	
2050	42	\$ 0.23	\$ 5.01	\$ 2.60%	\$24.64	
2051	43	\$ 0.22	\$ 5.14	\$ 2.60%	\$24.88	
2052	44	\$ 0.21	\$ 5.27	\$ 2.60%	\$25.11	
2053	45	\$ 0.20	\$ 5.41	\$ 2.60%	\$25.33	\$1.2560

Cascade's Long Term Real Discount Rate: 4.170%
 IRP Discount Rate = 7.631%
 Revised Discount Rate= 7.631%
 Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

**CASCADE NATURAL GAS CORPORATION
INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - MONTE CARLO LOW PRICE
45 YEAR RESOURCE SUMMARY COSTS - MELED COST PER THERM**

YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	PORTFOLIO COSTS WITH 10% CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2009	1	\$ 0.83	\$ 0.90	\$ 0.83	\$0.92	
2010	2	\$ 0.71	\$ 0.83	-7.94%	\$ 1.55	\$1.70
2011	3	\$ 0.64	\$ 0.80	-3.13%	\$ 2.19	\$2.41
2012	4	\$ 0.61	\$ 0.82	2.33%	\$ 2.80	\$3.08
2013	5	\$ 0.57	\$ 0.82	0.45%	\$ 3.37	\$3.71
2014	6	\$ 0.53	\$ 0.83	0.97%	\$ 3.91	\$4.30
2015	7	\$ 0.50	\$ 0.83	0.37%	\$ 4.41	\$4.85
2016	8	\$ 0.47	\$ 0.84	0.77%	\$ 4.87	\$5.36
2017	9	\$ 0.44	\$ 0.85	0.70%	\$ 5.31	\$5.84
2018	10	\$ 0.40	\$ 0.84	-1.02%	\$ 5.71	\$6.28
2019	11	\$ 0.38	\$ 0.85	1.77%	\$ 6.09	\$6.70
2020	12	\$ 0.36	\$ 0.86	0.81%	\$ 6.45	\$7.09
2021	13	\$ 0.32	\$ 0.83	-3.88%	\$ 6.77	\$7.44
2022	14	\$ 0.30	\$ 0.84	1.92%	\$ 7.07	\$7.77
2023	15	\$ 0.28	\$ 0.86	1.61%	\$ 7.35	\$8.09
2024	16	\$ 0.27	\$ 0.87	1.03%	\$ 7.62	\$8.38
2025	17	\$ 0.26	\$ 0.89	3.06%	\$ 7.87	\$8.66
2026	18	\$ 0.24	\$ 0.90	1.04%	\$ 8.11	\$8.92
2027	19	\$ 0.24	\$ 0.95	5.93%	\$ 8.35	\$9.18
2028	20	\$ 0.25	\$ 1.11	15.89%	\$ 8.60	\$9.46
2029	21	\$ 0.24	\$ 1.13	2.60%	\$ 8.85	\$9.73
2030	22	\$ 0.23	\$ 1.16	2.60%	\$ 9.08	\$9.98
2031	23	\$ 0.22	\$ 1.19	2.60%	\$ 9.30	\$10.23
2032	24	\$ 0.21	\$ 1.23	2.60%	\$ 9.51	\$10.46
2033	25	\$ 0.20	\$ 1.26	2.60%	\$ 9.71	\$10.68
2034	26	\$ 0.19	\$ 1.29	2.60%	\$ 9.90	\$10.89
2035	27	\$ 0.18	\$ 1.32	2.60%	\$ 10.08	\$11.09
2036	28	\$ 0.17	\$ 1.36	2.60%	\$ 10.25	\$11.28
2037	29	\$ 0.17	\$ 1.39	2.60%	\$ 10.42	\$11.46
2038	30	\$ 0.16	\$ 1.43	2.60%	\$ 10.57	\$11.63
2039	31	\$ 0.15	\$ 1.47	2.60%	\$ 10.72	\$11.80
2040	32	\$ 0.14	\$ 1.50	2.60%	\$ 10.87	\$11.95
2041	33	\$ 0.14	\$ 1.54	2.60%	\$ 11.00	\$12.10
2042	34	\$ 0.13	\$ 1.58	2.60%	\$ 11.13	\$12.25
2043	35	\$ 0.12	\$ 1.63	2.60%	\$ 11.26	\$12.38
2044	36	\$ 0.12	\$ 1.67	2.60%	\$ 11.38	\$12.51
2045	37	\$ 0.11	\$ 1.71	2.60%	\$ 11.49	\$12.64
2046	38	\$ 0.11	\$ 1.76	2.60%	\$ 11.60	\$12.76
2047	39	\$ 0.10	\$ 1.80	2.60%	\$ 11.70	\$12.87
2048	40	\$ 0.10	\$ 1.85	2.60%	\$ 11.80	\$12.98
2049	41	\$ 0.09	\$ 1.90	2.60%	\$ 11.89	\$13.08
2050	42	\$ 0.09	\$ 1.95	2.60%	\$ 11.98	\$13.18
2051	43	\$ 0.08	\$ 2.00	2.60%	\$ 12.06	\$13.27
2052	44	\$ 0.08	\$ 2.05	2.60%	\$ 12.14	\$13.36
2053	45	\$ 0.08	\$ 2.10	2.60%	\$ 12.22	\$13.44

Cascade's Long Term Real Discount Rate: 4.170%
 IRP Discount Rate = 7.631%
 Revised Discount Rate= 7.631%
 Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

**CASCADE NATURAL GAS CORPORATION
INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - MONTE CARLO AVERAGE PRICE
45 YEAR RESOURCE SUMMARY COSTS - MELDED COST PER THERM**

YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	PORTFOLIO COSTS WITH 10% CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2009	1	\$ 0.90	\$ 0.97	\$ 0.90	\$0.99	
2010	2	\$ 0.78	\$ 0.90	\$ 1.68	\$1.85	
2011	3	\$ 0.72	\$ 0.89	\$ 2.40	\$2.64	
2012	4	\$ 0.68	\$ 0.91	\$ 3.07	\$3.38	
2013	5	\$ 0.64	\$ 0.93	\$ 3.72	\$4.09	
2014	6	\$ 0.60	\$ 0.93	\$ 4.32	\$4.75	
2015	7	\$ 0.56	\$ 0.93	\$ 4.87	\$5.36	\$0.8987
2016	8	\$ 0.52	\$ 0.94	\$ 5.40	\$5.94	
2017	9	\$ 0.49	\$ 0.95	\$ 5.89	\$6.48	
2018	10	\$ 0.46	\$ 0.95	\$ 6.34	\$6.98	\$0.8677
2019	11	\$ 0.43	\$ 0.97	\$ 6.77	\$7.45	
2020	12	\$ 0.40	\$ 0.97	\$ 7.18	\$7.89	
2021	13	\$ 0.36	\$ 0.94	\$ 7.54	\$8.29	
2022	14	\$ 0.34	\$ 0.96	\$ 7.88	\$8.67	
2023	15	\$ 0.32	\$ 0.98	\$ 8.20	\$9.03	
2024	16	\$ 0.31	\$ 0.99	\$ 8.51	\$9.36	
2025	17	\$ 0.29	\$ 1.02	\$ 8.80	\$9.68	
2026	18	\$ 0.27	\$ 1.03	\$ 9.08	\$9.98	
2027	19	\$ 0.26	\$ 1.07	\$ 9.34	\$10.28	
2028	20	\$ 0.28	\$ 1.23	\$ 9.62	\$10.59	\$0.7908
2029	21	\$ 0.27	\$ 1.26	\$ 9.89	\$10.88	
2030	22	\$ 0.25	\$ 1.30	\$ 10.15	\$11.17	
2031	23	\$ 0.25	\$ 1.33	\$ 10.40	\$11.44	
2032	24	\$ 0.23	\$ 1.36	\$ 10.63	\$11.69	
2033	25	\$ 0.22	\$ 1.40	\$ 10.85	\$11.94	
2034	26	\$ 0.21	\$ 1.44	\$ 11.07	\$12.17	
2035	27	\$ 0.20	\$ 1.47	\$ 11.27	\$12.39	
2036	28	\$ 0.19	\$ 1.51	\$ 11.46	\$12.61	
2037	29	\$ 0.18	\$ 1.55	\$ 11.64	\$12.81	
2038	30	\$ 0.18	\$ 1.59	\$ 11.82	\$13.00	\$0.7675
2039	31	\$ 0.17	\$ 1.63	\$ 11.99	\$13.19	
2040	32	\$ 0.16	\$ 1.68	\$ 12.15	\$13.36	
2041	33	\$ 0.15	\$ 1.72	\$ 12.30	\$13.53	
2042	34	\$ 0.14	\$ 1.76	\$ 12.44	\$13.69	
2043	35	\$ 0.14	\$ 1.81	\$ 12.58	\$13.84	\$0.7587
2044	36	\$ 0.13	\$ 1.86	\$ 12.71	\$13.98	
2045	37	\$ 0.13	\$ 1.91	\$ 12.84	\$14.12	
2046	38	\$ 0.12	\$ 1.95	\$ 12.96	\$14.25	
2047	39	\$ 0.11	\$ 2.01	\$ 13.07	\$14.38	
2048	40	\$ 0.11	\$ 2.06	\$ 13.18	\$14.50	\$0.7511
2049	41	\$ 0.10	\$ 2.11	\$ 13.28	\$14.61	
2050	42	\$ 0.10	\$ 2.17	\$ 13.38	\$14.72	
2051	43	\$ 0.09	\$ 2.22	\$ 13.48	\$14.82	
2052	44	\$ 0.09	\$ 2.28	\$ 13.57	\$14.92	
2053	45	\$ 0.09	\$ 2.34	\$ 13.65	\$15.02	\$0.7446

Cascade's Long Term Real Discount Rate: 4.170%
 IRP Discount Rate = 7.631%
 Revised Discount Rate= 7.631%
 Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

**CASCADE NATURAL GAS CORPORATION
INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - MONTE CARLO HIGH PRICE
45 YEAR RESOURCE SUMMARY COSTS - MELED COST PER THERM**

YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	PORTFOLIO COSTS WITH 10% CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2009	1	\$ 0.96	\$ 1.04	\$ 0.96	\$1.06	
2010	2	\$ 0.85	\$ 0.98	\$ 1.81	\$1.99	
2011	3	\$ 0.79	\$ 0.99	\$ 2.60	\$2.86	
2012	4	\$ 0.75	\$ 1.00	\$ 3.35	\$3.68	
2013	5	\$ 0.71	\$ 1.03	\$ 4.06	\$4.46	
2014	6	\$ 0.66	\$ 1.03	\$ 4.72	\$5.20	
2015	7	\$ 0.62	\$ 1.03	\$ 5.34	\$5.87	\$0.9848
2016	8	\$ 0.58	\$ 1.04	\$ 5.92	\$6.51	
2017	9	\$ 0.54	\$ 1.05	\$ 6.46	\$7.11	
2018	10	\$ 0.51	\$ 1.07	\$ 6.98	\$7.67	\$0.9541
2019	11	\$ 0.48	\$ 1.08	\$ 7.46	\$8.20	
2020	12	\$ 0.45	\$ 1.08	\$ 7.90	\$8.70	
2021	13	\$ 0.41	\$ 1.05	\$ 8.31	\$9.14	
2022	14	\$ 0.38	\$ 1.07	\$ 8.69	\$9.56	
2023	15	\$ 0.36	\$ 1.10	\$ 9.06	\$9.96	
2024	16	\$ 0.34	\$ 1.12	\$ 9.40	\$10.34	
2025	17	\$ 0.33	\$ 1.15	\$ 9.73	\$10.70	
2026	18	\$ 0.31	\$ 1.16	\$ 10.04	\$11.04	
2027	19	\$ 0.29	\$ 1.19	\$ 10.33	\$11.37	
2028	20	\$ 0.31	\$ 1.36	\$ 10.65	\$11.71	\$0.8747
2029	21	\$ 0.30	\$ 1.39	\$ 10.94	\$12.04	
2030	22	\$ 0.28	\$ 1.43	\$ 11.23	\$12.35	
2031	23	\$ 0.27	\$ 1.47	\$ 11.50	\$12.65	
2032	24	\$ 0.26	\$ 1.50	\$ 11.75	\$12.93	
2033	25	\$ 0.25	\$ 1.54	\$ 12.00	\$13.20	
2034	26	\$ 0.23	\$ 1.58	\$ 12.23	\$13.46	
2035	27	\$ 0.22	\$ 1.62	\$ 12.46	\$13.70	
2036	28	\$ 0.21	\$ 1.67	\$ 12.67	\$13.94	
2037	29	\$ 0.20	\$ 1.71	\$ 12.87	\$14.16	
2038	30	\$ 0.19	\$ 1.75	\$ 13.07	\$14.37	\$0.8484
2039	31	\$ 0.18	\$ 1.80	\$ 13.25	\$14.57	
2040	32	\$ 0.18	\$ 1.85	\$ 13.42	\$14.77	
2041	33	\$ 0.17	\$ 1.89	\$ 13.59	\$14.95	
2042	34	\$ 0.16	\$ 1.94	\$ 13.75	\$15.13	
2043	35	\$ 0.15	\$ 1.99	\$ 13.90	\$15.29	\$0.8384
2044	36	\$ 0.15	\$ 2.05	\$ 14.05	\$15.45	
2045	37	\$ 0.14	\$ 2.10	\$ 14.19	\$15.61	
2046	38	\$ 0.13	\$ 2.15	\$ 14.32	\$15.75	
2047	39	\$ 0.13	\$ 2.21	\$ 14.44	\$15.89	
2048	40	\$ 0.12	\$ 2.27	\$ 14.56	\$16.02	\$0.8300
2049	41	\$ 0.11	\$ 2.33	\$ 14.68	\$16.15	
2050	42	\$ 0.11	\$ 2.39	\$ 14.79	\$16.27	
2051	43	\$ 0.10	\$ 2.45	\$ 14.89	\$16.38	
2052	44	\$ 0.10	\$ 2.51	\$ 14.99	\$16.49	
2053	45	\$ 0.09	\$ 2.58	\$ 15.08	\$16.59	\$0.8228

Cascade's Long Term Real Discount Rate: 4.170%
IRP Discount Rate = 7.631%
Revised Discount Rate= 7.631%
Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

Appendix I

2007 Action Plan Progress Report & 2007 OPUC Update

2007 Action Plan Progress

Review of Economic Drivers

In 2007, Cascade will hire an outside consultant to review the economic drivers underlying the econometric models used for residential, commercial and industrial forecasts. In so doing, Cascade expects to develop improvements to the model when forecasting the demand for its core customers.

Progress:

The company hired an outside consultant, Forefront Economics to review the economic drivers underlying the econometric models used for the residential, commercial and industrial forecast. No modifications to the underlying equations were necessary.

Update Distribution Analysis

The company will update its distribution system analysis to incorporate changes to the contracted non-core peak delivery requirements resulting from the rate Schedule 663 rate design change.

Progress:

Cascade's rate schedule 663 rate design change allowed Non-core customers to elect whether or not to have firm delivery on Cascade's distribution system. The revisions became effective in January 2007 and were not incorporated into the Company's 2007 IRP. In this planning cycle, the models were revised for those customers that elected to receive interruptible distribution service.

Conservation Plan

By early May 2007, the company will file its Conservation and Low Income Weatherization Plan, which will include specific conservation therm saving targets and programs for 2007, 2008, & 2009 and will make certain modifications to it.

- As part of the Conservation and Low Income Weatherization Plan will
 - a. modify the low-income weatherization program to allow up to 100% of the cost effectiveness limit on qualifying energy efficiency measures, providing the overall program is still cost-effective.
 - b. implement a custom program for the Commercial/Industrial sector, which will provide incentives for cost effective energy savings measures that are not included in the Company's existing prescriptive program.
 - c. outsource the program delivery and administration of its Commercial/Industrial conservation programs in order to improve participation levels.
 - d. implement a prescriptive program for the new construction market that provides incentives to customers meeting Energy Star insulation and duct work standards in their new home/facility.
 - e. Implement a prescriptive program that provides incentives to customers installing Weatherization measures in existing homes.

Progress:

Cascade's IRP contained several action items that were to be addressed with the filing of a Conservation & Low Income Weatherization Plan (Conservation Plan). The, Conservation plan was initially filed with the WUTC on May 5, 2007. The Conservation Plan was

2007 Action Plan Progress

eventually approved on October 1st of the same year after some revisions, primarily the increasing of the original therm targets for the 2008, 2009 and 2010 period.

Monitor Climate Change Initiative

Follow and analyze the impacts of Washington's new Climate Change Challenge, announced in February 2007 and any new initiatives that may arise from these efforts.

Progress:

Since Governor Gregoire announced the Executive Order creating Washington's Climate Change Challenge in February 2007, Cascade has monitored the progress of the Challenge as it pertains to the utility. Since many of the specific requirements are still unknown, the company anticipates that new regulations will be determined during 2009 so the 2010 monitoring timeline can be met. During this time period it will be easier to determine how the initiative will impact Cascade and its customers.

Analysis of Supply Side Alternatives

Supply side resources will continue to be evaluated on an ongoing basis. The various options include firm supplies with contracts of varying lengths and pricing alternatives, spot market supplies, and customer peaking supplies. Storage resources will also be evaluated including those developed by pipelines or investors. Site specific LP and LNG resources located within Cascade distribution system will remain a viable alternative and will be investigated. Pipeline capacity utilization along with future capacity requirements will also be evaluated on an ongoing basis to maintain the optimum cost of the resource portfolio and to stand ready with requests for incremental capacity if the need arises.

Progress:

The Company continues to analyze the various supply side alternatives available through the use of the Sendout model. Current efforts have been on the analysis of the Sunstone and Blue Bridge Pipeline Expansion projects which would bring additional supplies from the Rockies to the Northwest.

Evaluation of LNG alternatives

The company will continue to monitor proposed LNG import facilities and will evaluate the various options as specific cost and capacity information becomes available.

Progress:

Cascade continues to monitor LNG import projects proposed for the Northwest as discussed in Section 6 of this Plan.

Monitor Futures

The Company will monitor the futures market for price trends and will continue to evaluate the effectiveness of its risk management policy.

Progress:

Cascade continues to monitor the futures market closely and evaluates whether adjustments to its risk management policy are necessary.

2007 Action Plan Progress

Integration Modeling

Cascade will continue to use the Sendout® model to evaluate supply, storage and interstate pipeline capacity requirements and refine those analyses through the use of VectorGas to evaluate the impacts of price and weather uncertainty on those resource decisions.

For the 2008 IRP, the company will expand its analysis to assess how variations in the levels of storage, transportation, or other resource alternatives impact the overall portfolio risk, as measured in terms of portfolio costs

Progress:

Cascade continues to utilize Sendout for evaluating resource options and determining the overall Supply Portfolio design. In the 2008 Plan, the company has assessed a wide variety of transportation and Import LNG options and has tested those under various pricing options.



2004 Integrated Resource Plan

Update

August 9, 2007

Cascade Natural Gas Corporation 2004 Integrated Resource Plan-Update

Cascade Natural Gas Corporation provides the following update to its 2004 Integrated Resource Plan as an informational filing in accordance with guideline 3 (g) of Order 07-022. The update describes the Company's progress on implementing its two-year action plan, provide an assessment of what has changed since the acknowledgement of the plan in August 2005, and explains any deviations from the acknowledged action plan.

2-Year Action Plan Progress

Cascade filed its last Integrated Resource Plan in December 2004 and it was acknowledged by the Oregon Public Utility commission in August 2005. Since that time, Cascade has made significant progress in meeting or exceeding its 2004 2-Year Action Plan targets. Some highlights include:

- The completion of an independent assessment of the Conservation resources that could be acquired within the Company's Oregon and Washington service territory.
- Implementation of Commercial/Industrial Conservation programs and a Low Income Weatherization program.
- Cascade transferred the administration and program delivery of the Company's conservation programs to the Energy Trust of Oregon and implemented an expanded Low Income Weatherization Program for delivery through the CAP agencies in the Oregon service territory
- The company has expanded its modeling capability to include Monte-Carlo analysis on the impacts of weather and price volatility on the portfolio through the use of VectorGas, which is an add-on to the Sendout Optimization model.

Appendix A includes the detailed 2004 Two-year Action Plan along with a description of the Company's progress on each of the items.

UPDATE OF CURRENT CONDITIONS

Cascade's resource planning continues to focus on ensuring that the Company can meet the needs of our firm gas sales customers in a way that minimizes costs over the long term. Physical gas supply is expected to be adequate to meet growing demand in the Pacific Northwest and North America, however, at a cost. As indicated in the 2004 Plan, many industry experts predicted additional imports of liquefied natural gas (LNG) would be needed, which would require new facilities to be built on the West & East coasts in order to allow supply to keep pace with growing demand. During the development of the 2004 Plan it was anticipated that new facilities could be located in the Northwest as early as 2008 and that a new Alaska Natural Gas Pipeline would also be available to serve the Northwest somewhere between 2012 and 2015. The result was that the long-term forecasts utilized in the 2004

Cascade Natural Gas Corporation 2004 Integrated Resource Plan-Update

plan, anticipated prices declining in the 2008 to 2012 period due to these additional supply sources.

2 years later, LNG facilities are still in the works for the northwest with several in the various permitting stages, however, at this time none are operational and it is not likely that a NW facility will be operational in 2008. Although Cascade's 2004 plan did not include acquisition of specific LNG resources, the overall cost of the 2004 preferred portfolio has been impacted as the current long term price forecasts are higher than the original levels assumed in the 2004 plan.

At this time the question still remains as to whether or not a new pipeline that will transport Alaskan natural gas into the North American market will be completed within the Company's planning period. It should be noted that most independent forecasts (such as that developed by the Energy Information Agency (EIA)) assume that an Alaskan pipeline will be completed between 2012 and 2015. Additionally, new technologies continue to provide additional resources in the Rocky Mountain regions. While there appears to be sufficient supply to meet the nation's and northwest's growing needs, long-term gas prices are expected to be higher than prior long-term forecasts and prices are expected to continue to be quite volatile for the foreseeable future. Higher prices provide the financial incentive for development of new sources in North America along with the importation of LNG.

- 20-year portfolio costs, on a Net Present Value (NPV) basis, are expected to range between \$3,041,877,000 to \$3,191,955,000 for the planning period, with an average cost per therm ranging between \$.4560 and \$.4798. This compares to the 2004 Plan's 20-year preferred portfolio cost of \$2,122,426,000 and estimated average cost per therm of \$.3177.
- Given the higher gas price forecasts, energy efficiency measures are even more cost effective than in the filed plan. Based on the updated price forecasts and the price uncertainty analysis the company prepared during the Winter 2006-2007 the company estimates that the levelized costs will most likely range between 75 to 92 cents per therm. This is a 15 to 32 cent increase over the levelized cost projected in the 2004 Plan.

As a result, Conservation measures are even more cost-effective than anticipated in the 2004 Plan, and the remainder of this update will focus on the Company's acquisition of demand side resources.

DEMAND SIDE RESOURCES ACQUISITION UPDATE

Since the filing of the 2004 Plan, the company has made significant strides in the acquisition of Conservation resources. In the 2004 2-year Action Plan, the company committed to continuing its Residential High Efficiency Equipment Program, and planned to implement two new programs; a Low Income Weatherization Program, and a Commercial/Industrial program. In addition to completing the stated action plan items, the Company 1) hired an

Cascade Natural Gas Corporation 2004 Integrated Resource Plan-Update

independent consultant to prepare assessments of the conservation potential in Cascade's Oregon and Washington service territory, 2) contracted with the Energy Trust of Oregon for administration and delivery of DSM programs in Oregon, 3) established the Oregon Low Income Weatherization Program in Cascade's Oregon service territory, and 4) formed a Conservation Advisory Group that provided technical assistance in the development of the Company's Conservation Plan which was filed with the WUTC in May 2007.

Residential High Efficiency Program

The Residential High Efficiency Program was originally implemented in October 2002. It was designed to encourage all of Cascade Natural Gas residential customers, in Washington and Oregon, to install energy efficient furnaces and hot water heaters in their homes. The program provides cash incentives to customers installing 90+ AFUE efficiency furnaces and 60+ Energy Factor (EF) water heaters. The program is available to all residential customers, whether they are new customers (either due to new construction or conversion from alternative fuel) or existing customers.

Through December 2006, the Company's program has had 7700 participants. Approximately, 5800 high efficiency furnaces and 2,000 water heaters have been installed. The company has provided \$1,550,000 in rebates and estimates cumulative therm savings of approximately 600,000 per year due to program participation. In the Company's 2004 IRP, the company estimated incremental annual savings of 148,400 per year from approximately 1400 furnaces and 450 water heater participants on an annual basis with approximately 30% of those installations occurring in the Company's Oregon service territory. At the time, the company planned to continue the program through 2010, as it was anticipated that market conditions would change so that an incentive would no longer be necessary to entice customers to choose the higher efficiency unit. In July 2006, this program was transferred to the Energy Trust of Oregon. Through the Energy Trust of Oregon, the incentive levels associated with these particular measures has changed. The prescriptive rebate available to customers for a high-efficiency furnace has been reduced to \$150 rather than the \$250 originally provided by the Cascade's program. The high-efficiency water heater measure has not only lowered the prescriptive rebate from \$50 to \$25, it has also increased the required energy factor from .60 to .62. In Washington, effective April 1, 2007, Cascade made similar modifications to the program, which is still administered through Cascade. The company increased the energy factor requirement from .60 to .62 for water heating equipment and lowered the rebated to \$25 for water heaters and \$200 for high-efficient furnaces, which was consistent with the Energy Trusts program specifications in 2006 and is consistent with other utilities operating within Washington.

Low Income Weatherization Program

The Company's 2004 Plan identified that a Low Income Weatherization program, similar to the Oregon State Mandated Weatherization program, offered in Cascade's eastern Washington area would be cost effective and as a result, the Company's 2-year action plan committed to implementing the program during the 2004/2005 winter season. The IRP originally contemplated the program would be offered only in Cascade's eastern Washington service territory and estimated that there would be approximately 100

participants per year. The company's original proposal to limit the program to the Company's eastern Washington service territory was due to the area having relatively more families that could qualify (based on county demographic data), as well as the fact that the winters are harsher and therefore improvements in home insulation was likely to produce more therm savings than in the more moderate climate of the western side of the state. The 2004 IRP proposed program assumed that the company would provide incentives of 25% of the cost effectiveness limit towards insulation measures with a cap of \$350 in rebate incentives and an additional \$150 (per participant) to the CAP agency to cover their administrative costs associated with the audit, paper work, etc. However, after further discussion with the Energy Project and a few of the CAP agencies the original program design was modified prior to implementation. The final program design included implementing a statewide program, increasing the rebate levels to provide 50% of the cost effectiveness limit and raising the maximum rebate incentive to \$1000 for the measures. Additionally, the Low Income Agencies suggested that the program should be expanded to allow 200 participants per year due to the long waiting lists of low income customers seeking gas weatherization programs. Following WUTC approval, the program was implemented in Fall 2005 and during the first year participation was extremely limited. Through December 2006, only 10 homes were weatherized with an estimated savings of approximately 400/therms per year for each of the participants.

Commercial/Industrial Incentive Program

Cascade implemented this program in September 2005 in both Washington and Oregon. The program contains four elements: a ceiling insulation program, a high-efficiency HVAC equipment program, a cooking equipment program and water heating equipment program. The program design was based on similar programs being offered in Oregon to Northwest Natural Gas customers through the Energy Trust of Oregon at the time the 2004 IRP was prepared. Since this was Cascade's first full scale commercial/industrial program, the company pursued a program based on prescriptive measures in order to minimize the administrative costs of the program and therefore improving its overall cost-effectiveness. The hope was that the successes the company was achieving on the residential side with its prescriptive programs could be easily achieved on the commercial side and this would minimize the administrative and program delivery costs associated with the program.

For Cascade's Oregon service territory, this specific program was discontinued after only 9 months, due to the transfer of all conservation programs to the Energy Trust. During the short 9 month period, Cascade did not have any Oregon customers participate in the program.

Energy Trust of Oregon Relationship

Beginning in July 2006, Cascade contracted with the Energy Trust of Oregon (ETO) for the delivery and administration of all of its conservation programs in Oregon. On the residential side, the ETO's programs replaced the company's High Efficiency Equipment program and state mandated weatherization program. ETO categorizes their programs under two categories, Home Energy Savings program for existing or retrofit sector and the New Homes programs which is available to the new construction sector. The Home Energy Savings program provides rebates to customers who install prescriptive measures such as shell

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insulation and duct sealing measures, high efficiency gas furnace along with an incentive for higher efficiency windows. The New Homes program provides incentives to residential customers who build Energy Star certified homes as well as offering incentives for the stand-alone measures.

One of the reasons the ETO is able to administer these energy programs on a more cost effective basis is that they eliminated the energy audit requirement for installing shell measures. The Oregon state mandated residential program had required that the utility provide an energy audit to customers and then, based on the results of the energy audit if they installed the measures identified in the study, they would be eligible for a rebate. Cascade found that only 1 in 3 customers who had an audit actually installed the conservation measures, which had an impact on the overall cost-effectiveness of the program, particularly from a TRC basis. The Energy Trust of Oregon does provide a service called a home energy review, however it is not a requirement to participate in the prescriptive programs.

On the commercial side, Oregon customers now have a custom program available, however, the other prescriptive measures are similar to those that had been offered by Cascade.

Based on the quarterly reports prepared by ETO, Cascade's first 6 months of participation resulted in annual therm savings of 75,895 with 23,373 in the residential sector and 52,522 in the commercial/industrial sector.

Oregon Low Income Weatherization Program

With the approval of the Company's decoupling mechanism in Oregon (UG 167) a portion of the public purpose funding was designated for the Oregon Low Income Weatherization (OLIW) program. The OLIW program increased both the level of incentives available to CAP agencies installing weatherization in low income residential homes and established a set amount of funds being available for these activities. Through mid 2007, actual participation has been limited and roughly \$140,000 remain in the program waiting to be spent as the agencies continue to increase the participation in this program. The company established an advisory group consisting of representatives of the company, the CAP agencies, CADO, and Commission Staff that meet quarterly to discuss the progress of both this and the Oregon Low Income Bill Assistance program.

Stellar Independent Study

During 2006, the Company hired Stellar Processes to prepare separate studies of the technical and achievable conservation potential for Cascade's Washington and Oregon service territories. Stellar Processes, working with Ecotope, provided a similar study to the Energy Trust of Oregon. The goal of the project was to provide Cascade with an estimate of the energy saving measures for the residential, commercial and industrial markets, an estimate of the costs for those measures and even more important, their potential applicability in Cascade's Oregon/ Washington service territory. Below is a description of the process utilized by Stellar to identify the potential savings for each market segment.

The approach used by Stellar to develop the technical potential was as follows:

- Quantified the current energy use by sector and customer type
- Estimated energy consumption by end use for each customer type
- Applied the forecasted growth rate to estimate the customer base available in future years
- Reviewed information on specific measures for applicability to Cascade's Oregon/Washington customers.

In order to quantify the Energy Use, Stellar utilized the Company's estimate of sales by customer group and market segment along with estimates of Energy Use Index (EUI energy/sqft) factors to calibrate their estimates to match the utilities actual sales data.

The methods used to estimate energy consumption by end use varied depending upon the customer group. For the residential sector, Stellar applied prototype models to estimate major end use consumption, which was then calibrated to actual sector consumption. For the commercial sector, the EUI factors provided consumption by end-uses and were based on information developed from a Washington Natural Gas study prepared in 1995. For the industrial sector, Stellar developed sharedown fractions that allocated therm sales to specific end-uses.

Stellar then applied the company's forecasted growth rate to estimate the customer base available in future years estimated total savings available at 2017 for Oregon and 2025 for Washington.

Lastly, Stellar reviewed information on specific measures for applicability to Cascade's customers. This information included estimates of incremental cost and savings but also assessed the market potential for specific measures. Applicability of some measures might depend on the fuel for space heating, for example. Also, the amount of remaining potential is affected by the extent to which the market for a specific product is currently saturated. Stellar's team used a wide variety of resources to estimate information for the individual measures. Where available, the Northwest Power Planning Council's (NPPC) Regional Technical Forum (RTF) data was utilized in the residential sector to collect costs and energy benefits. In addition, the NPPC libraries provided cost and benefit data for many of the commercial sector measures. In some cases, technical papers or data provided by manufacturers was used. To determine the applicability of measures to the service territory and to assess market conditions, economic and census data was collected from Economy.com and from the U.S. Census Bureau and the Department of Housing and Urban Development.

The complete list of the measures identified and their applicability to Cascade's Oregon service territory are included in Appendix B. The study provided a complete list of all conservation measures available by segment, including total estimated therm savings, estimated incremental costs, and the estimated levelized cost per therm. The technical potential was screened based on some level of estimated avoided costs. For purposes of the Oregon Study, Stellar screened measures based on \$1.70 which was consistent with the

2004 Action Plan- Progress

Review of Economic Drivers

Cascade will re-evaluate the underlying economic drivers utilized in its residential, commercial and industrial demand forecasting models and modify the econometric equations as necessary.

Progress:

The Company has reviewed the results of the demand forecasting model and believes that the underlying economic drivers are still appropriate and that the forecasts are reasonable. During 2007, the company plans to hire an outside consultant to review the economic drivers underlying the econometric models used for residential, commercial and industrial forecast and in so doing, the company expects to develop improvements to the existing models used to forecast the demand for its core customers.

Residential High-Efficiency Equipment Rebate Program

Cascade will continue to offer its High-Efficiency equipment rebate program to Washington and Oregon residential customers for the next 5 years, providing the program remains cost-effective.

Progress:

Cascade continues to offer this program and has had strong participation throughout the past two years. Through December 2006, the program has had 7700 participants in Washington and Oregon. In Oregon, this program was transferred to the Energy Trust in July 2006 and these measures are included in the ETO's Home Energy Savings program.

Low Income Weatherization Program

During the Winter 2004/2005 timeframe, Cascade will implement a Low-Income weatherization program in Eastern Washington. The company will plan to offer this program for the next 10 years, providing it remains cost-effective. Cascade will continue to evaluate the cost-effectiveness of offering a Low-Income weatherization program. The Company will further evaluate information regarding non-energy benefits associated with low-income weatherization programs and include them in the analysis as necessary.

Progress:

Cascade's Low-Income Weatherization Program was implemented in the fall of 2005. During the first year of the program 10 customers participated in this new weatherization program. In May 2006, Cascade began offering an expanded Low Income Weatherization Program to its Oregon Customers that replaced the previously State Mandated Program. Through June 2007, the expanded Oregon program has had limited participation, with 16 participants.

Commercial/Industrial Program

By Spring 2005, Cascade will implement incentive programs for Commercial and Industrial customers in both Washington and Oregon that provide cash rebates to those customers installing high-efficiency HVAC equipment, Cooking equipment, Water heating equipment and/or ceiling insulation measures.

Progress:

Cascade implemented its Commercial/Industrial Program in September 2005, which included the measures identified in the 2004 Plan. Through 2006, only one commercial customer had participated in this program in Washington. In Oregon, this program was transferred to the Energy Trust in July 2006 and these measures are included in the ETO's Business Energy Solutions program.

Analysis of Supply Side Alternatives

Supply side resources will continue to be evaluated on an ongoing basis. The various options include firm supplies with contracts of varying lengths and pricing alternatives, spot market supplies, and customer peaking supplies. Storage resources will also be evaluated including those developed by pipelines or investors. Site specific LP and LNG resources located within Cascade distribution system will remain a viable alternative and will be investigated. Pipeline capacity utilization along with future capacity requirements will also be evaluated on an ongoing basis to maintain the optimum cost of the resource portfolio and to stand ready with requests for incremental capacity if the need arises.

Progress:

The Company has continued to examine the various supply side alternatives available through the use of the Sendout model. As a result of this on-going analysis, the company participated in the 2006 Jackson Prairie Expansion. The additional Jackson Prairie storage service will begin as early as November 1, 2008 and will replace the access to storage that was available through the Avista storage contract, which Avista declined to extend after the 2006/07 heating season. The new Agreement will provide Cascade with twice the amount of daily deliverability than the Avista agreement (30,000 Dth/d vs. 15,000 Dth/d) with approximately the same annual storage quantity. Cascade has also entered into a companion transportation Agreement with Northwest Pipeline for the transportation of gas supplies stored under this Agreement to Cascade's service area.

Evaluation of LNG alternatives

The company will evaluate the Port Westward LNG, as well as other LNG options, as specific cost and capacity information becomes available.

Progress:

Cascade continues to monitor LNG import projects proposed for the Northwest.

Expand IRP modeling

Cascade plans purchase the VectorGas program that will allow the Company to prepare monte-carlo scenario analysis that will measure the impacts of weather and price volatility on the Company's portfolio.

Progress:

Cascade has purchased the VectorGas program and utilized it in developing the 2007 Washington Plan.

**Oregon 2017 Technical Potential
Residential Sector Conservation Measures**

Measure Code	Measure Description	Measure Group	Average Lifetime	Total Incremental Cost, \$	Total O&M Impact, \$	Gas Savings Therms	Level Cost, \$/th
N-C117	E* Insulation, Ducts (Zone1)	ResPkgNewGas	45	7,539,513	0	666,792	\$0.461
N-C118	Heating upgrade (AFUE 90) (Zone1)	ResPkgNewGas	18	62	73	5	\$1.859
N-C119	Window U=.3 (Zone1)	ResPkgNewGas	45	7,247,864	0	178,027	\$1.660
N-C120	HRV, E* (Zone 1)	ResPkgNewGas	45	14,304,995	0	535,289	\$1.090
N-C121	E* Plus (FTC) Insulation (Zone1)	ResPkgNewGas	45	37,065,888	0	769,658	\$1.964
N-C122	E* Insulation, Ducts (Zone2)	ResPkgNewGas	45	7,539,513	0	1,051,513	\$0.292
N-C123	AFUE 90 (Zone 2)	ResPkgNewGas	18	62	73	8	\$1.213
N-C124	Window U=.3 (Zone 2)	ResPkgNewGas	45	7,247,864	0	266,305	\$1.110
N-C125	HRV, E* (Zone 2)	ResPkgNewGas	45	14,304,995	0	791,009	\$0.738
N-C126	E* Plus (FTC) Insulation (Zone 2)	ResPkgNewGas	45	37,065,888	0	1,136,340	\$1.330
R-H111	Duct Sealing, Zone 1	ResHVACRetrofitgas	20	2,150,178	0	154,302	\$0.937
R-H112	AFUE 90+ Furnace, Zone 1	ResHVACRetrofitgas	18	5,710,447	0	359,767	\$1.154
R-H113	AFUE 85 DHW combo, Zone 1	ResHVACRetrofitgas	18	3,357,896	0	69,466	\$3.515
R-H114	Combo with Hot Water delivery, Zone1	ResHVACRetrofitgas	30	3,062,291	900,334	132,727	\$1.523
R-H115	Duct Sealing and AFUE 90+, Zone 1	ResHVACRetrofitgas	20	3,239,854	599,736	254,855	\$1.013
R-H116	Duct Sealing, Zone 2	ResHVACRetrofitgas	20	2,150,178	0	270,827	\$0.534
R-H117	AFUE 90+ Furnace, Zone 2	ResHVACRetrofitgas	18	5,710,447	0	764,956	\$0.543
R-H118	AFUE 85 DHW combo, Zone 2	ResHVACRetrofitgas	18	3,357,896	0	118,263	\$2.064
R-H119	Combo with Hot Water delivery, Zone 2	ResHVACRetrofitgas	30	3,062,291	900,334	233,801	\$0.865
R-H120	Duct Sealing and AFUE 90+, Zone 2	ResHVACRetrofitgas	20	3,239,854	599,736	415,234	\$0.622
R-WG106	Tank upgrade (50 gal gas)	ResDHWNewgas	15	2,786,953	0	101,859	\$2.292
R-WG107	Tank upgrade (50 gal gas) condensing	ResDHWNewgas	15	4,344,765	0	112,190	\$3.244
R-WG108	Solar hot water heater (50 gal) - Solar Zone 2. With gas backup.	ResDHWNewgas	20	4,490,316	0	150,210	\$2.009
R-WG109	Tankless Gas heater	ResDHWNewgas	20	7,007,149	0	876,712	\$0.537
R-WG110	Tankless Gas heater	ResDHWGasReplace	20	4,914,588	0	562,701	\$0.587
R-WG117	Wx insulation 2 measures, Zone 1	ResWxRetrofitgas	45	728,564	0	78,254	\$0.380
R-WG118	Wx insulation 1 added measure, Zone 1	ResWxRetrofitgas	45	932,689	0	243,141	\$0.156
R-WG119	Window, replacement (U=.35), Zone 1	ResWxRetrofitgas	45	4,371,814	0	120,403	\$1.481
R-WG120	Window upgrade (U=.35), Zone 1	ResWxRetrofitgas	45	42,504	0	1,881	\$0.921
R-WG121	HRV, Zone 1	ResWxRetrofitgas	18	607,137	271,384	14,256	\$4.481
R-WG122	Wx insulation 2 measures, Zone 2	ResWxRetrofitgas	45	2,583,090	0	387,723	\$0.272
R-WG123	Wx insulation 1 added measure, Zone 2	ResWxRetrofitgas	45	3,306,807	0	1,254,399	\$0.108
R-WG124	Window, replacement (U=.35), Zone 2	ResWxRetrofitgas	45	13,175,057	0	616,227	\$1.026
R-WG125	Window upgrade (U=.35), Zone 2	ResWxRetrofitgas	45	150,695	0	9,629	\$0.638
R-WG126	HRV, Zone 2	ResWxRetrofitgas	18	2,152,576	962,178	76,775	\$2.950

Oregon 2017 Technical Potential Commercial Sector Conservation Measures

Measure Code	Measure Description	Comment	Construction Type	Measure End Use	Gas Impacts kTherms	Levelized Cost, \$/kWh	Levelized Cost, \$/th
Co107	Infrared Fryer		At Replacement	Cooking	325	na	\$0.0804
Co109	Infrared Griddle		At Replacement	Cooking	29	na	\$0.5849
Co110	Power Range Burner		At Replacement	Cooking	41	na	\$0.4105
Co116rep	Estar Steam Cooker	Install Energy Star Steam Cooker	At Replacement	Cooking	69	na	\$0.0397
E101	Wall Insulation - Blown R11	Wall Insulation - Blown R11. Application: Old buildings	Retrofit	Heating	211	\$0.0119	\$0.1334
E102	Wall Insulation - Spray On for Metal Buildings	Wall Insulation - Spray On for Metal Buildings (Cellulose) Unfinished. Application: Old buildings	Retrofit	Heating	21	na	\$0.1845
E103	Roof Insulation - Rigid R0-11	Roof Insulation - Rigid R0-11-not including re-roofing costs but including deck preparation. Application: Old buildings with flat roofs and no attics	At Replacement	Heating	46	\$0.0127	\$0.1421
E104	Roof Insulation - Rigid R0-22	Roof Insulation - Rigid R0-22-- not including re-roofing costs but including deck preparation and ~4" rigid.. Application: Old buildings with flat roofs and no attics	At Replacement	Heating	53	\$0.0192	\$0.2148
E105	Roof Insulation - Rigid R11-22	Roof Insulation - Rigid R11-22 2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs, no attics, and some insulation	At Replacement	Heating	88	\$0.0273	\$0.3062
E106	Roof Insulation - Rigid R11-33	Roof Insulation - Rigid R11-33: add 4' of insulation at reroof. Application: Old buildings with flat roofs, no attics, and some insulation	At Replacement	Heating	32	\$0.0917	\$1.0276
E107	Roof Insulation - Blanket R0-19	Roof Insulation - Blanket R0-19. Application: Buildings with open truss unfinished interior	Retrofit	Heating	29	\$0.0197	\$0.2209
E108	Roof Insulation - Blanket R0-30	Roof Insulation - Blanket R0-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	30	\$0.0211	\$0.2367
E109	Roof Insulation - Blanket R11-30	Roof Insulation - Blanket R11-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	10	\$0.1437	\$1.6096
E110	Roof Insulation - Blanket R11-41	Roof Insulation - Blanket R11-41. Application: Buildings with open truss unfinished interior	Retrofit	Heating	12	\$0.1350	\$1.5126
E111	Roof Insulation - Attic R0-30	Roof Insulation - Attic R0-30. Application: Buildings with uninsulated attics	Retrofit	Heating	25	\$0.0079	\$0.0886
E112	Roof Insulation - Attic 11-30	Roof Insulation - Attic 11-30. Application: Buildings with partially insulated attics	Retrofit	Heating	49	\$0.0293	\$0.3278
E113	Roof Insulation - Roofcut 0-22	Roof Insulation - Roofcut 0-22. Application: Buildings with uninsulated flat roofs at reroofing time	At Replacement	Heating	0	\$0.0741	\$0.8302
E114	Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: Old buildings	At Replacement	Heating	11	\$0.0290	\$0.3129
E115	Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: Old buildings	At Replacement	Heating	15	\$0.0385	\$0.4158
E116	Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: Old buildings	At Replacement	Heating	40	na	\$0.9915
E117	Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: Old buildings	At Replacement	Heating	7	na	\$2.6372
E118	Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: Old buildings	At Replacement	Heating	20	na	\$1.4943
E119	Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: Old buildings	At Replacement	Heating	30	na	\$2.4394
E120	Windows - Tinted AL Code to Class 45	Windows - Tinted AL Code to Class 45. Application: Old buildings	At Replacement	Heating	0	\$0.0620	\$0.6703

Oregon 2017 Technical Potential Commercial Sector Conservation Measures

Measure Code	Measure Description	Comment	Construction Type	Measure End Use	Gas Impacts kTherms	Levelized Cost, \$/kWh	Levelized Cost, \$/th
E121	Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: Old buildings	At Replacement	Heating	3	\$0.0638	\$0.6893
E122	Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: Old buildings	At Replacement	Heating	6	\$0.1245	\$1.3452
H101	Warm Up Control	This measure is designed to implement a shut down of outside air when the building is coming off night setback. Usually the capability for this is available in a commercial t-stat but either the extra control wire is not attached or the unit itself has not been set up to receive the signal. Cost is based on labor cost to enable this ability in existing controllers	Retrofit	Heating	132	na	\$0.2387
H102	DCV	Applicable to single zone packaged systems with large make -up air fractions either because of intermittent occupancy or because of code requirements. In most cases the outdoor air is reset to 5% or less with CO2 build-up modulating ventilation.	Retrofit	Heating	101	\$0.0513	\$0.5096
H103	Ducts	Duct retrofit of both insulation and air sealing	Retrofit	Heating	45	\$0.0724	\$0.6936
H104	Hot Water Temperature Reset	Controller automatically resets the delivery temperature in a hot water radiant system based on outside air temperature. The reset reduces the on-time of the heating equipment and the occurrence of simultaneous heating and cooling through instantaneous adjustments.	Retrofit	Heating	86	na	\$0.0980
H105	HW Boiler Tune	Tune up in accordance with Minneapolis Energy Office protocol. Can include derating the burner, adjusting the secondary air, adding flue restrictors, cleaning the fire-side of the heat exchanger, cleaning the water side, or installing turbulators. Other modifications may include uprating the burner to reduce oxygen or derating the burner to reduce stack temperature. Note: In gas systems, excess air and stack temperatures are often within reasonable ranges, so the technical potential for this measure is limited. Combining this measure with the vent damper and power burner measures increases both applicability and cost effectiveness, and was assumed for this analysis.	Retrofit	Heating	2	na	\$0.0842
H106	Steam Balance	Single-pipe steam systems are notorious for uneven heating, which wastes energy because the thermostat must be set to heat the coldest spaces and overheating other spaces. Steam balances corrects these problems by: 1) Adding air venting on the main line or at the radiators; 2) Adding boiler cycle controls; 3) Adding or subtracting radiators. Energy savings accrue from lowering the overall building temperature.	Retrofit	Heating	43	na	\$0.1404
H107	Vent Damper	Install vent damper downstream of the draft relief to prevent airflow up the stack, while allowing warm air from the boiler to spill into the conditioned space as heat or into the boiler room to reduce jacket losses. This measure is most cost-effective when combined with the boiler tune up and power burner measures.	Retrofit	Heating	11	na	\$0.3220
H108	Power burner	Replace standard burner with a power burner to optimize combustion and reduce standby losses in the stack. Note: Costs and savings assume that this measure will be performed in conjunction with a boiler tune up when appropriate.	Retrofit	Heating	114	na	\$0.6469
H111	SPC Hieff Boiler Replace	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	At Replacement	Heating	8	na	\$0.4023
H112	SPC Cond Boiler Replace	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	At Replacement	Heating	14	na	\$0.6707

Oregon 2017 Technical Potential Commercial Sector Conservation Measures

Measure Code	Measure Description	Comment	Construction Type	Measure End Use	Gas Impacts kTherms	Levelized Cost, \$/kWh	Levelized Cost, \$/th
H114	Hi Eff Unit Heater (replace)	Install power draft units (80% seas. Eff) in place of natural draft (64% seas. Eff)	At Replacement	Heating	103	na	\$0.2050
H115a	Cond Unit Heater from Nat draft(replace)	Install condensing power draft units (90% seas. Eff) in place of natural draft (64% seas. Eff)	At Replacement	Heating	179	na	\$0.6375
H115b	Cond Unit Heater from power draft (replace)	Install condensing power draft units (90% seas. Eff) in place of power draft (80% seas. Eff)	At Replacement	Heating	46	na	\$1.2897
H116	Cond Furnace (repl)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.	At Replacement	Heating	115	na	\$1.4962
H129	Steam Trap Maintenance	Set up a in-house steam trap maintenance program with equipment, training, and trap replacement. An alternative procedure is to just pay for an outside contractor to conduct a steam survey.	Retrofit	Heating	48	na	\$1.4150
R106rep	Heat Reclaim	Large Grocery - Heat recovery to space heating. Assumes floating head control exists and must be changed to allow HR.	At Replacement	Heating	600	na	\$0.3796
W119	Combo Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	At Replacement	Heating	20	na	\$0.3076
W120	Combo Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	At Replacement	Heating	39	na	\$0.6063
W101	DHW Wrap	Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.	Retrofit	Water Heat	7	na	\$0.1855
W102	DHW Shower Heads	Install low flow shower heads (2.0 gallons per minute) to replace 3.4 GPM shower heads.	Retrofit	Water Heat	34	na	\$0.2073
W103	DHW Faucets	Add aerators to existing faucets to reduce flow from 3.4 gallons per minute to 2.0 GPM.	Retrofit	Water Heat	5	na	\$0.3869
W104	DHW Pipe Ins	Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.	Retrofit	Water Heat	5	na	\$0.7323
W105	DHW Recirc Controls	Install electronic controller to hot water boiler system that turns off the boiler and circulation pump when the hot water demand is reduced (usually in residential type occupancies) or can be reset to meet the hot water load. (Steel boilers also require a mixing valve to prevent water temperatures from dropping below required levels).	Retrofit	Water Heat	34	na	\$0.8438
W108	DHW Condensing Tank (repl)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	At Replacement	Water Heat	59	na	\$0.5031
W113	DHW Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	At Replacement	Water Heat	18	na	\$0.5889
W114	DHW Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	At Replacement	Water Heat	36	na	\$0.9403
W123r	HiEff Clothes Washer	Install high performance commercial clothes washers - residential sized units	At Replacement	Water Heat	5	na	\$0.9779
W124r	Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	Retrofit	Water Heat	46	na	\$0.3410
W125r	Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	Retrofit	Water Heat	91	na	\$1.6024
W127r	Waste Water Heat Exchanger	Install HX on waste water	Retrofit	Water Heat	18	na	\$0.1967
Co112	Infrared Fryer		New	Cooking	130	na	\$0.0774
Co114	Infrared Griddle		New	Cooking	16	na	\$0.5531

Oregon 2017 Technical Potential Commercial Sector Conservation Measures

Measure Code	Measure Description	Comment	Construction Type	Measure End Use	Gas Impacts kTherms	Levelized Cost, \$/kWh	Levelized Cost, \$/th
Co115	Power Range Burner		New	Cooking	24	na	\$0.4031
Co116	Estar Steam Cooker	Install Energy Star Steam Cooker	New	Cooking	32	na	\$0.0397
E123	Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: New Construction	New	Heating	6	\$0.0343	\$0.3707
E124	Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: New Construction	New	Heating	7	\$0.0459	\$0.4963
E125	Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: New Construction	New	Heating	19	na	\$1.1119
E126	Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: New Construction	New	Heating	4	na	\$2.6845
E127	Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: New Construction	New	Heating	10	na	\$1.5286
E128	Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: New Construction	New	Heating	16	na	\$2.5064
E129	Windows - Tinted AL Code to Class 45	Windows - Tinted AL Code to Class 45. Application: New Construction	New	Heating	0	\$0.0800	\$0.8644
E130	Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: New Construction	New	Heating	2	\$0.0798	\$0.8617
E131	Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: New Construction	New	Heating	3	\$0.1529	\$1.6523
H117	SPC Hieff Boiler (new)	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	New	Heating	19	na	\$0.3458
H118	SPC Cond Boiler (new)	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	New	Heating	35	na	\$0.5778
H119	HiEff Unit Heater (new)	Install power draft units (80% seas. Eff) in place of natural draft (64% seas. Eff)	New	Heating	49	na	\$0.1768
H120a	Cond Unit Heater from Nat Draft (new)	Install condensing power draft units (90% seas. Eff) in place of natural draft (64% seas. Eff)	New	Heating	85	na	\$0.5498
H120b	Cond Unit Heater From Power Draft (new)	Install condensing power draft units (90% seas. Eff) in place of power draft (80% seas. Eff)	New	Heating	22	na	\$1.1124
H121	Cond Furnace (new)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.	New	Heating	52	na	\$1.2535
H122	HVAC System Commissioning	HVAC system commissioning. Includes testing and balancing, damper settings, economizer settings, and proper HVAC heating and compressor control installation. This measure includes the proper set-up of single zone package equipment in simple HVAC systems. The majority of the Commercial area is served by this technology. Work done in Eugene (Davis, et al, 2002) suggests higher savings than the other documented commissioning on more complex systems.	New	Heating	160	\$0.1754	\$1.6799
H123	HVAC controls	Control set up and algorithm. This assumes the development of an open source control package aimed at describing scheduling and control points throughout the HVAC system, properly training operators so that scheduling can be maintained and adjusted as needed, and providing operator back up so that temperature reset, pressure reset, and minimum damper settings are	New	Heating	281	\$0.0789	\$0.9100

Oregon 2017 Technical Potential Commercial Sector Conservation Measures

Measure Code	Measure Description	Comment	Construction Type	Measure End Use	Gas Impacts kTherms	Levelized Cost, \$/kWh	Levelized Cost, \$/th
		set at optimum levels for the current occupancy.					
R106	Heat Reclaim	Large Grocery - Heat recovery to space heating. Assumes floating head control exists and must be changed to allow HR.	New	Heating	271	na	\$0.3717
W121	Combo HiEff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	New	Heating	11	na	\$0.2787
W122	Combo Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	New	Heating	21	na	\$0.5429
W109	DHW Condensing Tank (new)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	New	Water Heat	41	na	\$0.4427
W115	DHW HiEff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	New	Water Heat	14	na	\$0.5471
W116	DHW Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	New	Water Heat	27	na	\$0.7970
W123	HiEff Clothes Washer	Install high performance commercial clothes washers - residential sized units	New	Water Heat	2	\$0.0913	\$0.9580
W124	Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	New	Water Heat	7	na	\$0.8963
W125	Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	New	Water Heat	14	na	\$4.2923
W127	Waste Water Heat Exchanger	Install HX on waste water	New	Water Heat	25	na	\$0.5975