

ENERGYNORTH NATURAL GAS, INC.  
d/b/a KeySpan Energy Delivery New England

2006 Integrated Resource Plan

DG 06-105

Response to Record Request

Date of Request: January 9, 2008

Date of Response: February 8, 2008

Exhibit No.: Exhibit 6

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**REQUEST:** What is the purpose of the review conducted by Massachusetts regulators of KeySpan's integrated resource plan? Provide the statute under which such review is conducted.

**RESPONSE:** The purpose of the review of KeySpan's integrated resource plan conducted by Massachusetts regulators is described in the attached order of the Massachusetts Department of Telecommunications and Energy in Docket D.T.E. 05-68. A copy of the Massachusetts statute under which the review is conducted, Mass. G.L.c. 164, § 691, is also attached to this response.



# The Commonwealth of Massachusetts

## DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

D.T.E. 05-68

October 13, 2006

Petition of Boston Gas Company, Colonial Gas Company, and Essex Gas Company, each d/b/a KeySpan Energy Delivery New England, to the Department of Telecommunications and Energy, pursuant to G.L. c. 164, § 69I, for Review and Approval of its Long-Range Resource and Requirements Plan for the forecast period November 1, 2005 through October 31, 2010.

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## I. INTRODUCTION

On October 13, 2005, Boston Gas Company (“Boston Gas”), Colonial Gas Company (“Colonial Gas”), and Essex Gas Company (“Essex Gas”), each d/b/a KeySpan Energy Delivery New England (collectively, “KeySpan” or “Company”), filed with the Department of Telecommunications and Energy (“Department”), pursuant to G.L. c. 164, § 69I, a petition for approval of its long-range forecast and requirements plan (“Plan”) for the forecast period of November 1, 2005 through October 31, 2010. The Company’s petition was docketed as D.T.E. 05-68.

Together, Boston Gas, Colonial Gas, and Essex Gas provide natural gas sales and transportation service to approximately 830,000 residential and commercial customers in 86 cities and towns. These companies are wholly owned subsidiaries of KeySpan New England, LLC, which is a subsidiary of KeySpan Corporation.

Pursuant to notice duly issued, the Department conducted a public hearing and procedural conference at its offices in Boston on December 7, 2005. The Attorney General intervened, as of right, pursuant to G.L. c. 12, §11E.

An evidentiary hearing<sup>1</sup> was held on March 30, 2006. KeySpan presented three witnesses in support of its Plan: Leo Silvestrini, director of sales and load forecasting for KeySpan; Theodore E. Poe, Jr., manager of load forecasting for KeySpan; and Elizabeth Danehy Arangio, director of gas-supply planning for KeySpan. The evidentiary

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<sup>1</sup> The Company and the Attorney General agreed to two extensions to the procedural schedule, extending the evidentiary hearing by seven weeks in total.

record consists of Company responses to 62 information requests and eight record requests. The Attorney General and KeySpan filed initial briefs on April 13, 2006. The Company filed its reply brief on April 24, 2006 and the Attorney General filed a reply brief on April 25, 2006.

## II. ANALYSIS OF THE LONG-RANGE FORECAST

### A. Standard of Review

Pursuant to G.L. c. 164, § 69I, the Department is required to ensure “a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.” In accordance with this mandate, the Department reviews the long-range forecast of each gas utility to ensure that the forecast accurately projects the gas sendout requirements of the utility's market area. G.L. c. 164, § 69I. A forecast must reflect accurate and complete historical data, and reasonable statistical projection methods. Id.; 980 C.M.R. § 7.02(9)(b). Such a forecast should provide a sound basis for resource planning decisions. Bay State Gas Company, D.T.E. 02-75, at 2 (2004); The Berkshire Gas Company, D.T.E. 02-17, at 2 (2003); The Berkshire Gas Company, 16 DOMSC 53, at 56 (1987).

In its review of a forecast, the Department determines if a projection method is reasonable based on whether the methodology is: (a) reviewable, that is, contains enough information to allow a full understanding of the forecast methodology; (b) appropriate, that is, technically suitable to the size and nature of the particular gas company; and (c) reliable, that is, provides a measure of confidence that the gas company's assumptions, judgments, and data will forecast what is most likely to occur. D.T.E. 02-75, at 2; D.T.E. 02-17, at 2; Haverhill

Gas Company, 8 DOMSC 48, at 50-51 (1982). Specifically, the Department examines a gas company's: (1) planning standards, including its weather data; (2) forecast method, including the forecast results; and (3) derivation and results of its design and normal sendout forecasts. See D.T.E. 02-75, at 2-3; D.T.E. 02-17, at 3; see also Boston Gas Company, D.P.U. 94-109 (Phase I), at 9 (1996). As part of the review of the forecast, the Department also examines the company's scenario analysis, which is used for evaluating the flexibility of the company's planning process, including any cold-snap analysis<sup>2</sup> and sensitivity analysis. D.T.E. 02-75, at 3; D.T.E. 02-17, at 3; Boston Gas Company, 25 DOMSC 116, at 200 (1992).

B. Previous Sendout Forecast Results

The last review completed for a forecast and supply plan filed by KeySpan was described by the Department in its decision in KeySpan Energy Delivery New England, D.T.E. 01-105 (2003) ("2003 KeySpan Decision").

C. Planning Standards

The first element of the Department's forecast review is an assessment of a company's planning standards in order to determine if they are reviewable, appropriate, and reliable. D.T.E. 02-75, at 2; D.T.E. 02-17, at 2; 8 DOMSC 48, at 50-51. A company's planning standards are used as a basis for projecting its sendout forecast, which, in turn, is used to ascertain the adequacy and cost of a company's supply plan. D.T.E. 02-75, at 2; D.T.E. 02-17, at 2; 8 DOMSC 48, at 50-51. The Department's review of a company's

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<sup>2</sup> A cold-snap is a prolonged series of days at or near design conditions. Colonial Gas Company, D.P.U. 93-13, at 66 (1995); Boston Gas Company, 25 DOMSC 116, at 217 (1992); Commonwealth Gas Company, 17 DOMSC 71, at 137 (1998).



planning standards begins with an examination of a company's weather data, and continues with an analysis of how a company arrived at its normal year, design year, and design day standards. D.T.E. 02-75, at 2; D.T.E. 02-17, at 2; 8 DOMSC 48, at 50-51.

1. Weather Data

a. Description

KeySpan maintains a record of daily effective degree day ("EDD") data<sup>3</sup> based on observations taken at the Logan International Airport ("LIA") weather station for the period January 1971 through December 2004 (Exh. KED-1, at 51-53). The Company uses this data to perform a statistical analysis to determine its design day and design year standards. The Company also maintains a record of the coldest day for each of the past 34 years, taken from the LIA weather data (*id.* at 53). KeySpan states that it used the LIA weather data to represent weather conditions in the Company's service territory because LIA is geographically centered within the Company's service territory (*id.*).

b. Analysis and Findings

In the Company's previously-approved forecast and supply plan, KeySpan demonstrated graphically and statistically that the LIA weather data are representative of weather conditions in the Company's service territory. 2003 KeySpan Decision at 5. In that proceeding, the Department approved the Company's use of LIA weather data. *Id.* at 4-5. Consequently, the

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<sup>3</sup> A degree day ("DD") is a measure of the coldness of the weather experienced, based on the extent to which the daily mean temperature falls below 65 degrees Fahrenheit. An EDD takes into account wind speed in determining the coldness of the weather. Colonial Gas Company, D.P.U. 96-18, at 16 (1996).

Department finds that the Company's current weather data from the same weather station is reliable and approves its use. In addition, the Department finds that the Company's use of a 34-year database is comparable to other weather databases approved previously by the Department. Id. at 5; Colonial Gas Company, 23 DOMSC 351, at 363-364 (1991); Boston Gas Company, 25 DOMSC 116, at 135-136 (1992); Fall River Gas Company, D.T.E. 99-26, at 4 (2000); Colonial Gas Company, D.P.U. 93-13, at 10 (1995). Therefore, the Department concludes that the Company has assembled an adequate database from which to develop the Company's planning standards and finds that the weather data used by KeySpan is reviewable, appropriate, and reliable.

2. Design Day Standard

a. Description

KeySpan states that it used daily EDD values from its weather database for the period 1971 through 2004 and applied a three-step process to establish its design day standard (Exh. KED-1, at 53).<sup>4</sup> First, the Company performed a statistical analysis of the coldest days recorded within its weather database. The Company selected the coldest day of each of the past 34 years and determined that these data points were normally distributed with a mean EDD value of 66.6 EDDs and a standard deviation of 6.1 EDDs (id.).

The Company next performed a cost-benefit analysis to compare the cost of maintaining resources necessary to meet design day demand to the cost to customers if experiencing service

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<sup>4</sup> The design day represents the coldest day for which the company plans to provide reliable firm service.

curtailments (id. at 52). The Company determined the probability-weighted costs of damages to residential and commercial and industrial (“C&I”) customers separately in the event a service curtailment should happen (id. at 54-55). For residential customers<sup>5</sup>, the Company calculated the costs of damages associated with two categories of avoided costs: (1) re-light expenses<sup>6</sup>, and (2) freeze-up costs<sup>7</sup> (id. at 53-54). For C&I customers, the Company calculated the costs associated with economic damages resulting from loss of production during a curtailment (id. at 54). The Company states that, in addition to estimating the costs to residential and C&I customers from a service curtailment, it estimated the costs associated with maintaining adequate deliverability at different EDD levels (id. at 55). Third, the Company states that it identified a design day standard that would maintain reliability on KeySpan’s system at the lowest cost (id. at 53).

Following the three-step process described above, the Company determined a range for a design day planning standard of 75 EDDs to 83 EDDs, selecting a design day standard of 79 EDDs (id. at 55). The Company states that the 79 EDD design day standard corresponds to a probability of occurrence of once in 43.62 years (id. at 52). The Company explains that

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<sup>5</sup> For the residential classes, KeySpan analyzed three levels of damages assuming that 25, 50, and 75 percent of potentially affected residential customers suffer damages (Exh. KED-1, at 55).

<sup>6</sup> The Company estimated residential re-light expenses, calculated in 2005 dollars, to be \$78.00 per customer (Exh. KED-1, Chart III-E-4).

<sup>7</sup> The Company estimated residential freeze-up costs, calculated in 2005 dollars, to be \$44,550.00 per customer, based on information provided by Marsh and McLennan, a property loss consulting firm (Exh. KED-1, at 54, Chart III-E-4).

the current 79 EDD design day standard is just one EDD less than the 80 EDDs recorded on January 15, 2004, which is the coldest day recorded in the LIA weather-site data since 1971 (id. at 55).

b. Analysis and Findings

The Department reviews design criteria to ensure that there is a reasonable relationship between forecast and actual conditions. See 1986 Gas Generic Order, 14 DOMSC 95, at 96-97, 104-105 (1986) (“Gas Generic Order”). Specifically, the Department evaluates how and why a company selects particular design weather criteria and the effect of the design standard on the reliability of a company’s forecast and the cost of its supply plan.

D.P.U. 94-109 (Phase I), at 17; Gas Generic Order at 97.

The Department’s design day criteria require an LDC to develop a statistically-derived design day standard and to analyze the cost implications of at least two levels of reliability as part of its analysis establishing the design day standard. D.T.E. 99-26, at 10. The analysis requires an LDC to account for the changes that affect both demand and supply conditions in the natural gas market.

The Department finds that KeySpan has established a reviewable, appropriate, and reliable design day standard that promotes both cost-effective and reliable resource planning. In establishing its design day standard, the Company has taken steps to balance the benefits of providing a reliable service against the costs of providing such services to customers. The Company has updated its analytical procedures in determining its design day standard by using updated cost estimates obtained from Marsh & McLennan, and by reexamining and updating

the potential re-light costs, which it used in the cost-benefit analysis (Exh. KED-1, at 54). The Department finds that KeySpan followed appropriate statistical and analytical procedures in establishing its design day standard of 79 EDDs. The Company used, for example, probability-weighted cost of damages to calculate the cost to residential customers of a service curtailment (id., Chart III-E-4, and Chart III-E-5).

The Department notes that KeySpan's design day standard of 79 EDDs is comparable to the design day standards of similarly situated LDCs in Massachusetts, which the Department approved. See North Attleboro Gas Company, D.T.E. 01-47, at 9-12 (2002); Boston Gas Company, D.P.U./D.T.E. 97-81, at 6-10 (2000). The Department finds KeySpan's design day standard is reviewable, appropriate, and reliable.

3. Normal Year Standard

a. Description

KeySpan states that it developed its normal year standard using weather data for the period 1971 through 2004 (Exh. KED-1, at 51). In establishing the normal year standard, the Company calculated the average annual number of EDD covering the 1971 through 2004 period and found the values to be within a normal distribution, with an average of 6,458.3 EDDs and a standard deviation of 348.4 EDDs (id.). Next, to construct its normal year standard, the Company selected, from its weather database, the month that most closely approximated the 20-year average EDD and standard deviation for each month (id.). Based on the above, the Company selected a normal year standard of 6,458 EDDs (id. at 51, 58, and Chart III-E-1).

b. Analysis and Findings

The record indicates that KeySpan based its normal year standard on an historical average of its data, and based its planning standards on an acceptable weather database. The Department, therefore, finds that KeySpan's method for determining its normal year planning standard is reviewable, appropriate, and reliable.

4. Design Year Standard

a. Description

KeySpan states that the Company's goal in developing a design year standard<sup>8</sup> is "to identify the amount of seasonal supplies of natural gas that will be required to provide continuous service under all reasonable weather conditions" (Exh. KED-1, at 56). The Company developed its design year standard using historical weather data for the period January 1974 through December 2004 (id. at 52- 53). The Company explains that, in establishing the design year standard, it followed a three-step process (id. at 56). First, it performed a statistical analysis of annual EDD data for the period 1974 through 2004, which showed that the data are normally distributed with a mean EDD of 6,458 (id. at 58, Chart III-E-1).

Next, the Company conducted a cost-benefit analysis to compare the benefit of maintaining an adequate supply under all reasonable weather conditions to the probability-weighted cost to customers of not maintaining an adequate supply leading to service curtailments (id. at 56). The Company explains that it viewed the costs associated with any

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<sup>8</sup> Design year is the coldest year for which a company plans.

service curtailments as an economic cost or penalty imposed on its service territory as a whole, hence it estimated potential losses<sup>9</sup> based on the product of the potential economic cost per day of service curtailment multiplied by the total number of days of service interruption<sup>10</sup> (id. at 57).

In the third step, the Company used the results of steps 1 and 2, described above, to identify a design year standard that would ensure an adequate and reliable supply at the lowest cost (id. at 57). By following this three-step process, the Company established a design year planning standard which falls within a range of 6,960 EDDs to 7,190 EDDs (id. at 60). The Company determined that the current design year standard of 7,120 EDDs corresponds to the probability of occurrence of once in 34.76 years and that it continues to be appropriate (id.).

b. Analysis and Findings

The Department notes that the Company has complied with Department precedent by using a methodology approved by the Department in the Company's previous supply plan.

See 2003 KeySpan Gas Decision, at 11-12. The Department finds that the Company's update

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<sup>9</sup> The Company explains that it calculated the potential losses by using data provided by Data Resources, Inc., to determine the average Gross State Product per day ("GSP/day") for the year 2004, which it then used as input into calculating the economic cost to its customers per day (Exh. KED-1, at 57-58).

<sup>10</sup> The Company explains that it determined the number of days of service interruption by analyzing its supply requirements at various EDD levels, then assigned the requirements to various supply sources and, finally, using 6,458 EDDs as the baseline, estimated when, how much, and how long it would experience a supply deficit (id. at 58-60; Chart III-E-8; Chart III-E-9; Chart III-E-10; and, Chart III-E-11).

of the weather input data, as well as the probabilistic and cost-benefit analyses, for developing the design year standards are reviewable, appropriate, and reliable. The Department, therefore, finds that the method for determining the design year standard provides a reasonable basis for resource planning decisions and, as such, is reviewable, appropriate, and reliable.

5. Cold-Snap Planning Standard

a. Description

KeySpan evaluated the ability of its current resource portfolio to meet sendout requirements should a cold-snap occur by establishing a cold-snap planning standard (Exh. KED-1, at 82-83). The Company established its cold-snap planning standard using 34 years' worth of weather data covering the period 1971-2004 (id.). Using the SENDOUT® model,<sup>11</sup> the Company modeled daily sendout to predict resource usage over a specified range of EDD values (id.). The results show that the mean total EDD for the last two weeks of February is 490.8, with a standard deviation of 73.3 EDDs (id.). The Company notes that a 1:50 probability of occurrence is 2.06 times the standard deviation above the mean (id.).

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<sup>11</sup> The SENDOUT® model is used for integrated resource planning in the natural gas industry. Specifically, it is used, among other things, to determine the optimal capacity levels of supply, transportation and storage for various scenarios (e.g., high and low supply prices, demand growth, emerging markets, customers lost to transport, etc.); for multi-year planning horizons; to evaluate the cost and service implications of changing the design level of service (e.g., coldest winter on record vs. coldest winter in last ten years), including the revenue generated from capacity release (i.e., peak day planning); and, to develop supply, transportation, and storage targets (i.e., capacity, price, and operating flexibility) to guide on-going contract negotiations and capital investments. The SENDOUT® software was developed by NewEnergy (Exh. KED-1, at 62-63).



To establish its fourteen-day cold-snap planning standard, the Company selected data for the coldest days observed during the period February 15-28 (id.). The coldest days during the period February 15-28 occurred in 1993 and had an EDD value of 625 (id.). The Company then scaled-up the actual daily data during this time frame to model a two-week period of design cold-snap (id.). The Company calculated the probability of occurrence for its cold-snap scenario to be once in 50 years (id.).

Using the base-case demand and the SENDOUT® model, the Company performed a simulation analysis to examine the effectiveness of its portfolio in meeting customer demand during normal weather from November 1 through February 14, the two-week cold-snap, followed by normal weather (id. at 83). The results of the cold-snap simulation indicate that the Company's portfolio was adequate to meet any cold-snap requirements during the forecast period (id.).

b. Analysis and Findings

In the 2003 KeySpan Decision at 14, the Department found that the Company's selection of a fourteen-day cold-snap in February featuring a 1:50 probability of occurrence to be consistent with KeySpan's overall design winter analysis. The Department, therefore, finds that KeySpan's cold-snap standard is reviewable, appropriate, and reliable.

6. Conclusions on Planning Standards

As discussed above, the Department finds that the Company's (1) weather database; (2) design day planning standard; (3) normal year planning standard; (4) design year planning standard; and (5) cold-snap planning standard are reviewable, reliable, and appropriate.

D. Forecasting Methods

1. Introduction

KeySpan presented a single forecasting methodology for the three Massachusetts distribution companies, for the period beginning November 1, 2005 through October 31, 2010 (Exh. KED-1, at 7). The Company states that the forecast methodology used in its forecast is the same as that approved by the Department in the 2003 KeySpan Decision (id. at 7).

KeySpan used the following five-step approach to develop the five-year forecast of customer requirements under design weather conditions: (1) forecasted incremental sendout; (2) developed reference year sendout using regression equations; (3) normalized the forecast of customer requirements; (4) determined design weather planning standards; and (5) determined customer requirements under design weather conditions (id. at 7-8).

The Company projects that under normal weather conditions, KeySpan will provide an incremental sendout<sup>12</sup> of 11,403 BBtus over the forecast period (id. at 8). KeySpan states that this growth in firm sales represents a 9.8 percent total increase in sendout over the forecast period, or an average annual increase of 1.9 percent (id. at 8).

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<sup>12</sup> In forecasting incremental sendout, KeySpan has identified the 2003-2004 split year as the reference year (Exh. KED-1, at 7).

2. Forecast of Incremental Sendout

a. Introduction

The Company defines annual incremental sendout as the net increase in load that KeySpan expects to experience each year over the forecast period (Exh. KED-1, at 8). This projection is added to the reference year sendout (id.). The 2003-2004 reference year is derived from KeySpan's regression analysis of the daily sendout and weather data from that year (id. at 9). The Company follows a multi-step process to forecast incremental sendout over the forecast period.

First, KeySpan develops a demand forecast of loads associated with traditional markets (id.). The Company's definition of traditional markets includes the residential sector (buildings with one to four units), the apartment sector (residential buildings with five or more units), and the C&I sector (id.).

Second, the Company develops a forecast of non-traditional markets (id.). The non-traditional markets include natural gas vehicle ("NGV"), seasonal firm gas sales made under special contracts, and large scale power generation (id.).

Third, the Company incorporates load reductions that result from KeySpan's conservation programs (id. at 10). According to the Company, these estimated reductions are exogenous to the demand forecast generated by the End-Use Model, and are based on KeySpan's approved market transformation program (id.).

Fourth, KeySpan develops a forecast of firm loads that are projected to migrate from sales to transportation only service (id. at 10). This projection is based on Boston Gas Company's experience (id.).<sup>13</sup>

Finally, the Company develops two alternative scenarios. The Company develops high and low sendout scenarios, which allows the Company to evaluate its ability to meet customer requirements under a range of weather and economic conditions (id.).

b. Demand Forecast for Traditional Markets

As stated above, KeySpan's five-year forecast of annual incremental sendout relies on the Company's End-Use Model. This model is discussed below.

i. End-Use Model

The Company's End-Use Model relies on extensive input data and the use of model algorithms to forecast demand (id. at 11). For the residential sector, the Company incorporates energy consumption by household and building type, the number of households by city and building type, and the end-use distribution of energy-consuming equipment by building type (id.). For the C&I sectors, the data consist of employment figures for the KeySpan service territory by region and North American Industry Classification Systems ("NAICS") codes, oil and gas price projections, equipment and building-stock energy efficiencies, and equipment replacement rates (id.). The Company's model projects total

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<sup>13</sup> Boston Gas Company's transportation program was initiated in 1996.

energy demand in its service territory by end use<sup>14</sup> and fuel (Exh. KED-1, at 12). The Company states that the end-use demand forecast for traditional markets is a four-step process that consists of: (1) identifying base-year energy demand in the Company's service territory by region, building type, end use, and fuel type; (2) comparing the model outputs to actual consumption for the years between the base year and the first year of the forecast; (3) forecasting incremental demand beyond 2006 by market segment under normal weather conditions; and (4) converting forecasted levels of annual incremental demand (sales) over the forecast period to incremental sendout requirements (id. at 13). For the filing currently under review, KeySpan re-calibrated the model for the years 2001 through 2004 (id. at 14).<sup>15</sup>

ii. Base-Year Energy Demand

For the current filing, the Company's base year is 2001 (id.). The Company's End-Use Model developed base-year total energy demand for traditional markets in KeySpan's service territory disaggregated by end use, building type, municipality, and fuel type (id.). The Company collected the input data for the calendar year 2001: (1) gas sales by rate class and by cities and towns; (2) employment by city, town, and NAICS code; (3) household data by city, town, and building type; (4) regulatory filings of electric utilities; and (5) energy consumption estimates made by state and federal government agencies (id.).

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<sup>14</sup> The end uses included in the Company's forecast are space heating, water heating, cooking, drying, and other (Exh. KED-1, at 12).

<sup>15</sup> The year 2001 represents the updated base year, and 2004 is the most recent year for which actual data is available (Exh. KED-1, at 14).

For the residential sector, the Company's base-year model incorporates the total number of households in its service territory and the total energy demand by city and building type (id. at 15-16). The Company's C&I sector base-year model incorporates employment data for KeySpan's service territory, energy intensity factors, and fuel market shares (id. at 16).

iii. End-Use Model Calibration

The Company states that it periodically re-calibrates its model to ensure accuracy (id. at 17). When it re-calibrates its End-Use Model, KeySpan prepares a back-cast, which it then compares to actual experience over a test period (id.). Based on the results of the comparison, the Company identifies and implements adjustments to the model so that differences between the back-cast and actual experience are eliminated (id.). The Company states that the calibration process is repeated until an acceptable level of accuracy of plus or minus two percent is achieved (id. at 18).

iv. Forecast of Incremental Demand for Traditional Markets

Using the base-year energy demand as a starting point, the Company forecasts annual incremental energy consumption by market segment based on the results of economic and demographic growth forecasts, fuel-price projections, equipment replacement rates, and equipment-efficiency assumptions (id.). For each market segment, the Company forecasts gross and net annual load additions (id. at 19).<sup>16</sup> The Company projects total gross throughput

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<sup>16</sup> Gross load additions are defined as increases in gas throughput volumes resulting from gas conversions of existing establishments and gas installations in newly constructed  
(continued...)

additions over the forecast period of 18,546 BBtus for its traditional core markets (Exh. KED-1, at 19). On a net basis, KeySpan projects that it will add 15,366 BBtus of core throughput during the same period (id.).

The Company's projection of load additions, in BBtus, for each sector of its traditional markets is as follows:

<b>Market</b>	<b>Total Gross Additions</b>	<b>Net Gross Additions</b>
Residential	10,362	8,315
Apartment House	1,079	216
Commercial & Industrial	7,105	6,232

c. Demand Forecast for Non-Traditional Markets

i. Natural Gas Vehicles

The Company projects that it will add 291 BBtus on both a net and gross basis in the NGV market during the forecast period (id. at 29). According to the Company, there are barriers and drivers that affect the development of the NGV market (id.). Therefore, KeySpan concludes that it will follow specific segments (id.). In particular, KeySpan will target its efforts on the following fleets: (1) the Massachusetts Bay Transportation Authority; (2) the Massachusetts Port Authority; (3) State and Municipal; (4) Commercial; and (5) the Commonwealth's State Implementation Plan and Green Fleets Program (id. at 29-33).

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<sup>16</sup>(...continued)

establishments. Net load additions are the difference between the current year gas throughput volumes and the previous year volumes. Net load additions take into consideration both load gains and load losses (Exh. KED-1, at 19).

ii. Seasonal Firm Gas Sales and Large-Scale Power Market

KeySpan projects no demand for the seasonal firm gas sales or large-scale power generation market (Exh. KED-1, at 33). The Company states that all seasonal firm gas sales and power generation previously served by KeySpan had already converted to transportation prior to the Company's filing (id.).

iii. Demand-Side Management

KeySpan projects average annual demand-side management ("DSM") related volume savings of 459 BBtus (id. at 34). In developing its forecast, the Company assumed that funding for all of KeySpan's DSM programs continues through the end of the forecast period.

d. Transportation Migration

In developing its transportation migration forecast, the Company developed two different forecasts. The first was to forecast migration from sales to transportation-only service, while the second was to forecast the number and load of new on-system customers taking transportation-only service (id. at 35).

1. Forecast of Migration from Traditional Sales to Transportation

In order to develop a forecast of transportation over the forecast period, KeySpan analyzed the migration history experienced by the Company over the 1997 through 2005 period (id. at 36). The Company developed three tiers comprised of customers with similar patterns<sup>17</sup> (id. at 36). According to the Company, the historical data indicates a flattening of

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<sup>17</sup> Tier 1 is comprised of residential and small C&I customers; Tier 2 is comprised of  
(continued...)



the percentages of transportation load relative to total load over the past seven years (id. at 36-37).

ii. Customers Direct to Transportation

The Company has observed that 2,182 BBtus of cumulative customer load has commenced service as transportation load in the first five years since the implementation of the Company's Distribution Service Terms and Conditions (id. at 38-39). According to the Company's analysis, 14 percent of the increase in new firm sales load will commence service as transportation customers (id. at 39). The Company expects that this trend will continue over the forecast period and has, therefore, reduced the forecasted incremental sendout volumes for firm sales service by 436 BBtus per year (id.).

e. Sensitivity Analysis

The Company began the sensitivity analysis by identifying the key variables contributing to the uncertainty of the demand forecast (id. at 42). The Company then developed a high and low demand scenario. In both scenarios, KeySpan assumed that oil and gas prices will remain the same as those in the base-case demand forecast (id. at 43).

For the high demand scenario, the Company assumed that employment and household growth rates will be 50 percent greater than those forecasted in the base-case scenario (id.).

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<sup>17</sup>(...continued)

large and medium C&I customers; and Tier 3 is comprised of extra large C&I customers (Exh. KED-1, at 36).

Consequently, the Company's high demand scenario results in incremental load additions of 21,311 BBTus and net additions of 18,137 BBTus over the forecast period (id. at 42-43).<sup>18</sup>

To derive the low demand scenario, KeySpan assumes that employment and household growth rates will be 50 percent lower than in the base-case scenario (id. at 44). The Company forecasts that under the low demand scenario, gross incremental load additions will total 15,872 BBTus and net load additions will total 12,681 BBTus (id. at 43-44).

f. Comparison of 2001 and 2005 Demand Forecasts

The Company prepared a comparison of the 2001 and 2005 demand forecasts. This comparison indicates that the total gross load and net load additions are lower in the current forecast than in the previous forecast (id. at 45). According to KeySpan, the factors driving this difference include: (1) higher projected residential sendout; (2) lower sendout for the apartment and C&I sectors; and (3) lower expected NGV sales (id. at 45). Further, the Company identifies DSM as a factor contributing to the decrease in sendout combined with the Company's projection of new transportation-only loads (id. at 45-46).

g. Comparison of Forecast to Actual Load

The Company also employed an ex-post facto analysis, which compared actual loads observed during the 2001 through 2004 period covered under the previously-approved forecast and supply plan to those loads predicted by the forecasting methodology provided in the current filing (id. at 46). In total, the forecasted loads are 0.2 percent,

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<sup>18</sup> The Company's base-case analysis forecasts gross additions of 18,546 BBTus and net additions of 15,366 BBTus (Exh. KED-1, at 43).

or 966 BBtus, lower than actual additions, or 193 BBtus per year (id.). According to the Company, these results show a minimal forecasting error (id.).

### 3. Regression Equation

The Company uses regression equations of daily sendout versus daily temperatures over a recent twelve-month period in order to calculate the reference year (id. at 47). The Company uses EDD data collected from Boston's LIA weather station. Based on this data, the company developed a linear regression equation for each of its four geographic areas (id.). According to the Company's analysis, sendout requirements are directly related to EDDs, sendout requirements change on a seasonal basis, sendout requirements are affected by EDDs that occur over a multi-day period, and sendout requirements differ each day (id. at 49).

### 4. Normalized Forecast of Customer Requirements

Finally, the Company combines the reference year sendout, which is derived from the regression analysis, with the annual incremental sendout to yield forecasts of customer requirements under normal weather conditions (id. at 50).

### 5. Positions of the Parties

The Company notes that its forecast methodology is the same as that approved by the Department in the 2003 KeySpan Decision (Company Brief at 8, 23). Further, KeySpan notes that the application of "end-use modeling" has been repeatedly approved and reviewed by the Department since 1990.<sup>19</sup> KeySpan argues that the Department should find its Plan reviewable,

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<sup>19</sup> The Company notes that the Department approved end-use modeling in the following decisions: 2003 KeySpan Decision; Boston Gas Company, D.P.U. 94-109 (1996);  
(continued...)

appropriate, and reliable (Company Brief at 23). Regarding the Company's approach of developing separate gas consumption estimates for existing and new categories of residential and C&I customers, the Company asserts that the Department has previously approved this technique (Company Brief at 24). Finally, the Company argues that KeySpan developed a statistically sound methodology to project sendout (Company Brief at 24).

The Attorney General did not address the Company's forecasting methods in his briefs.

#### 6. Analysis and Findings

In preparing its demand forecasts, KeySpan used the same end-use modeling methodology approved previously by the Department. See 2003 KeySpan Decision; Boston Gas Company, D.P.U. 94-109 (1996). Further, the Department has found that the end-use methodology is widely used in the industry and also by the Energy Information Administration of the Department of Energy to prepare demand forecasts. 2003 KeySpan Decision at 37.

Similar to the application of its end-use methodology, the Department notes that the Company's forecasting methodology employs the same traditionally proven techniques that the Department has previously approved. See Id., at 37. Regarding the predictive power of its model, the Company employed an ex-post facto analysis, which demonstrated negligible forecasting error. This analysis compared actual to forecast load additions for the historical five-year period covered under the previously-approved forecast and supply plan (Exh. KED-1, at 46).

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<sup>19</sup>(...continued)

Boston Gas Company, EFSC 91025 (1992); and, Boston Gas Company, EFSC 88-25 (1990) (Company Brief at 9).

The Department finds that the Company developed a statistically sound methodology to project sendout. Consequently, the Department finds that the Company's sendout model is appropriate, reviewable, and reliable for forecasting the normal year, design year, and design day sendout for the residential and C&I classes. The Department, therefore, finds the Company's demand forecasts to be appropriate, reviewable, and reliable. With regard to the sensitivity analysis, the Department finds that KeySpan used appropriate and reasonable methods and forecasting techniques to develop its high and low demand scenarios.

In conclusion, the Department finds that KeySpan used appropriate statistical tools and forecasting methodologies to forecast energy demand and sendout during the forecast period. The Department, therefore, finds KeySpan's long-range forecast to be reviewable, appropriate, and reliable.

### III. ANALYSIS OF THE SUPPLY PLAN

#### A. Introduction

In this section, the Department reviews the adequacy of the Company's supply planning process, the Company's supply plan, and the cost of the Company's supply plan. In addition, the Department reviews the Company's supply plan and identifies elements that represent potential contingencies affecting the adequacy of supply or that potentially affect the cost of the supply plan.

B. Standard of Review

The Department is required to ensure “a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.” G.L. c. 164, § 69I. In fulfilling this mandate, the Department reviews a gas company's supply planning process and the two major aspects of every utility's supply plan: adequacy and cost.<sup>20</sup> Commonwealth Gas Company, D.P.U. 92-159, at 53 (1995); D.P.U. 93-13, at 49-50; 25 DOMSC 116, at 201.

The Department reviews a gas company's five-year supply plan to determine whether the plan is adequate to meet projected normal year, design year, design day, and cold-snap firm sendout requirements. 25 DOMSC 116, at 201. The Department's review of reliability, another necessary element of a gas company's supply plan, is included in the Department's consideration of adequacy. See D.T.E. 99-26, at 18; D.P.U. 93-13, at 50 n.22; 25 DOMSC 116, at 201 n.87. In order to establish adequacy, a gas company must demonstrate that it has an identified set of resources that meet its projected sendout under a reasonable range of contingencies. 25 DOMSC 116, at 201 n.87. If a company cannot establish that it has an identified set of resources which meet sendout requirements under a reasonable set of contingencies, the company must then demonstrate that it has an action plan which meets projected sendout in the event that the identified resources will not be available when expected. D.P.U. 96-18, at 31; D.P.U. 92-159, at 54; D.P.U. 93-13, at 50.

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<sup>20</sup> G.L. c. 164, § 69I also directs the Department to balance cost considerations with environmental impacts in ensuring that the Commonwealth has a necessary supply of energy. D.P.U. 96-18, at 31; D.P.U. 92-159, at 53; D.P.U. 93-13, at 50.

In its review of a gas company's supply plan, the Department reviews a company's overall supply planning process. D.P.U. 92-159, at 53. An appropriate supply planning process is essential to the development of an adequate, low-cost, and low environmental impact resource plan. Id. Pursuant to this standard, a gas company must establish that its supply planning process enables it to: (1) identify and evaluate a full range of supply options, and (2) compare all options including DSM on an equal footing. D.P.U. 96-18, at 31; D.P.U. 92-159, at 54; D.P.U. 93-13, at 51; 25 DOMSC 116, at 202.

Finally, the Department reviews whether a gas company's five-year supply plan minimizes cost. 25 DOMSC 116, at 203. A least-cost supply plan is one that minimizes costs subject to trade-offs with adequacy and environmental impact. D.P.U. 92-159, at 55; D.P.U. 93-13, at 51-52; 25 DOMSC 116, at 203. Here, a gas company must establish that application of its supply planning process has resulted in the addition of resource options that contribute to a least-cost plan. D.P.U. 92-159, at 55.

C. Previous Supply Plan Review

In the Company's most recently approved forecast and supply plan, the Department found that KeySpan had established that its normal year, design year, design day, and cold-snap supply plans were adequate to meet the Company's forecast sendout requirements throughout the forecast period. See 2003 KeySpan Decision at 60. In addition, the Department found that KeySpan had: (1) developed appropriate criteria for screening and comparing supply-side resources, and (2) addressed the need for a mechanism to undertake the comparison of resources on an equal basis. Id. Finally, the Department found that the

Company's supply planning process, as a whole, may lead to the addition of resources that contribute to a least-cost supply plan. Id.

D. Supply Plan Resources

1. Portfolio Design

In order to ensure that the Company's resource portfolio is designed to meet customer requirements in the most reliable and least-cost manner, KeySpan examines its existing resource portfolio in relation to the Company's firm sendout forecast (Exh. KED-1, at 4, 62). As part of this analysis, KeySpan reviewed possible strategies for meeting customer requirements using the existing resource portfolio in a variety of circumstances (Company Brief at 25-26). KeySpan utilizes the SENDOUT® Model to: (1) identify the least-cost portfolio that will meet forecasted customer demand; (2) test the sensitivity of the portfolio to key inputs and assumptions; (3) test the portfolio's ability to meet all planning standards and contingencies; and (4) identify the need for, as well as type of, any additional resources required during the forecast period (Exh. KED-1, at 4, 62).<sup>21</sup>

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<sup>21</sup> The Company states that since Boston Gas first began using the SENDOUT® Model developed by New Energy Associates in 1996, SENDOUT® has become KeySpan's primary analytical tool in the portfolio design process (Exh. KED-1, at 62). SENDOUT® is a linear-programming optimization software tool used to assist in the evaluation, selection, and explanation of long-term portfolio strategies (id.). The model can: (1) identify the optimal dispatch of resources that minimizes the cost of serving a specified demand given existing resources and system operating constraints, and (2) determine the optimal portfolio to meet a given demand by using a linear-programming algorithm that analyzes combinations of contracts to determine the combination that results in the lowest total cost (id. at 62-63).



KeySpan has identified a resource portfolio structured to meet design day and design year sendout requirements and is comprised of the following categories of resources:

(1) domestic transportation; (2) underground-storage contracts; (3) Canadian contracts; (4) supplemental resources; (5) other purchased resources; and (6) gas-commodity supplies (id. at 64).

## 2. Transportation Services

KeySpan has capacity entitlements on multiple upstream pipelines that provide access to a variety of domestic production fields (id.). KeySpan's transportation agreements provide:

(1) transportation of gas supplies to the Company's citygates; (2) transportation for underground-storage withdrawal and injection; and (3) flexibility in meeting any balancing and no-notice requirements (id. at 64-65). KeySpan's contract entitlements to long-haul capacity are used to transport gas from production areas in the Gulf of Mexico and Western Canada to underground-storage facilities in Pennsylvania and New York and to the Company's citygates (id. at 65). KeySpan's contract entitlements to short-haul capacity are used to transport gas from these underground-storage facilities to the Company's citygates (id.).<sup>22</sup> KeySpan also has contract entitlements to long-haul and short-haul capacity used to transport gas from eastern Canadian provinces to the Company's citygates (id.). KeySpan's transportation contracts are summarized in Attachment A.

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<sup>22</sup> These short-haul contracts are also used to ensure the deliverability of non-storage supplies to the Company's citygates when the capacity is not being used to transport underground-storage supplies (Exh. KED-1, at 65).

### 3. Underground-Storage Services

KeySpan indicates that underground-storage capacity represents an essential component of the Company's cost minimization strategy (id. at 67). This category of assets provides KeySpan with the ability to meet heating season loads while avoiding the expense of adding 365-day long-haul transportation capacity (id.). KeySpan states that underground-storage supplies also allow the Company to serve peak-period requirements with lower cost, off-peak gas and to manage minimum take requirements or short-term fluctuations in demand (id. at 68). In addition to firm storage contracts with Tennessee Gas Pipeline ("TGP") and Texas Eastern, KeySpan also holds firm storage contracts with Honeoye Storage Corporation, National Fuel Supply Corporation, and Dominion Gas Transmission, Inc. (Company Brief at 27). KeySpan's storage contracts are summarized in Attachment B.

### 4. Canadian Supplies

KeySpan asserts that the Company's Canadian gas supplies contribute towards the diversity, flexibility, and reliability of the resource portfolio and fall into two categories: (1) bundled capacity and gas commodity from Western Canada associated with contracts with Alberta Northeast, Ltd., BP Canada Energy Company, and NEXEN Marketing, and (2) gas commodity from Eastern Canada associated with a contract with Imperial Oil Resources (Exh. KED-1, at 68).

### 5. Supplemental Resources

In addition to interstate pipeline and storage resources, peaking supplies are utilized to meet KeySpan's design day requirements (id. at 69). KeySpan utilizes both on-system and

off-system supplemental resources to meet system needs. Off-system peaking resources include the Company's firm vapor and liquefied natural gas ("LNG") contracts with Distrigas, as well as a storage contract with KeySpan LNG, LLC ("KLNG") (id.; Chart IV-C).<sup>23</sup>

KeySpan's off-system supplemental peaking resources are summarized in Attachment C.

On-system supplemental facilities are local production plants that store LNG and liquid propane until vaporized (id. at 69). These facilities are used to meet seasonal requirements in excess of pipeline resources and off-system supplemental facilities, as well as to preserve the delivery pressure of the system (id. at 69-70). On-system facilities are distributed strategically across KeySpan's service territory to enhance service reliability (id. at 70). KeySpan's on-system supplemental peaking resources are summarized in Attachment D.

#### 6. Other Purchased Resources

The Company's current resource portfolio is sufficient to meet KeySpan's forecasted design year sendout requirements throughout the forecast period with the addition of "Other Purchased Resources" during the heating season (id. at 71). Other Purchased Resources represent resources that are needed and must be acquired by the Company on a short-term or long-term basis to fill an identified gap in the resource portfolio (id.). Other Purchased Resources may take the form of citygate-delivered supply, gas supply purchases in the market delivered to the Company's citygates on Company-owned capacity resources, or short-term

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<sup>23</sup> KLNG has been a wholly-owned subsidiary of KeySpan Energy Development Corporation since December 13, 2002 (Exh. AG-4). KLNG is the owner and operator of the 600,000 barrel, Federal Energy Regulatory Commission-regulated LNG storage and receiving facility located in Providence, Rhode Island (Exh. AG-4).

capacity purchases (id.). The Company states that bringing supplies to the KeySpan system during the peak season allows the Company to avoid using storage and on-system supplemental resources until it becomes necessary (id.). The Company asserts that this strategy minimizes resource portfolio costs since KeySpan: (1) will not be incurring demand charges for capacity that is not needed on a design day basis, and (2) will be able to better utilize existing transportation capacity that is available when underground-storage supplies are not being transported to the Company's citygates (id. at 71-72). In addition, the Company may be able to fill the need for Other Purchased Resources through the addition of long-term capacity contracts or other long-term arrangements (id. at 72).

#### 7. Gas-Commodity Supplies

For the period April 1, 2003 through March 31, 2006, KeySpan operated under an Asset Management Contract with Merrill Lynch Commodities, Inc. ("MLC") (id. at 72). Under the terms of this contract, MLC was obligated to provide up to 669,445 MMBtus/day of citygate delivered-supplies (Exh. DTE 1-15). Required supplies that were in excess of the MLC obligation were obtained by KeySpan through market-area purchases and short-term supply options (Exh. KED-1, at 72). On March 29, 2006, the Department approved a revised natural gas optimization service contract between KeySpan and MLC for effect April 1, 2006. The total maximum daily quantity ("MDQ") of the asset-management contract approved by the Department remains at 669,445 MMBtus/day (Exh. AG-1-9).

8. Total Design Day Deliverability

KeySpan's design day deliverability from its resource portfolio for the split years 2005-2006 and 2006-2007 is 1,268,044 MMBtus (Exh. DTE 1-16). KeySpan anticipates adding 112,700 MMBtus/day of long-haul capacity from the TGP ConneXion project during the split year 2007-2008, at which point the Company's design day deliverability will increase to 1,380,744 MMBtus (id.).

E. Adequacy of Supply Plan

Under this section, the Department analyzes and reviews the adequacy of the Company's supply plan through the supply resources available to meet its demand and maintain its firm load sendout requirements. In reviewing adequacy, the Department first examines whether the company's base-case supply plan is adequate to meet its projected normal year, design year, design day, and cold-snap firm sendout requirements. The Department then reviews whether the company's plan is adequate to meet its sendout requirements if certain supplies become available. If the supplies are not found to be adequate under the base-case and contingency plans, then the company must establish that it has an action plan to obtain the supplies required to meet the projected firm sendout requirements. See D.P.U. 93-13, at 62; Boston Gas Company, 25 DOMSC 116, at 212-213 (1992); 16 DOMSC 53, at 76.

1. Normal Year and Design Year Adequacy

a. Description

KeySpan submitted its supply plans for meeting its forecasted normal year and design year sendout requirements throughout the forecast period (Exh. KED-1, Table G-22N Revised,

Table G-22D Revised). KeySpan explained that it plans to meet its normal year and design year heating season needs by using a combination of several existing supply, underground-storage, LNG, propane, and interstate pipeline contracts (id. at 64). KeySpan forecasts that normal year firm sendout requirements for the base case will increase from 92,246 BBtus in the 2005-2006 heating season to 102,454 BBtus in the 2009-2010 heating season. KeySpan forecasts that design year firm sendout requirements for the base case will increase from 99,800 BBtus in the 2005-2006 heating season to 111,097 BBtus in the 2009-2010 heating season (id., Table G22-N Revised, Table G22-D Revised).

b. Positions of the Parties

i. Attorney General

The Attorney General states that the supply plan will have a deficiency under design year conditions beginning in the 2006-2007 heating season. While the Attorney General acknowledges that the deficiency represents only approximately one percent of the Company's total design heating season requirements in 2006-2007 season, the Attorney General asserts that the deficiency: (1) will increase in the event of a delay in the in-service date of the ConneXion project, and (2) may affect a concentrated local area of the Company's service territory (Attorney General Brief at 4-5).<sup>24</sup>

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<sup>24</sup> While the Attorney General states that the deficiency may affect a concentrated local area of the Company's service area, he concedes that this possibility cannot be verified as the data presented in this proceeding neither permits nor supports this conclusion (Attorney General Brief at 4).

ii. The Company

The Company asserts that its resource plan is sufficient to meet design year load requirements throughout the forecast period under base case and high demand case scenarios with the addition of incremental long-term capacity resources and supplemental short-term firm arrangements and market area purchases during the peak period (Company Brief at 30).<sup>25</sup> The Company states that while there is a slight deficiency under the design season base-case scenario during the 2006-2007 heating season, this deficiency is entirely eliminated for the 2007-2008 heating season and beyond, given the addition of the ConneXion capacity that is projected to become available on or around November 1, 2007 (Tr. at 22-23).

c. Analysis and Findings

KeySpan's filing indicates a resource deficiency under design conditions in the 2006-2007 heating season. The Department notes that the Company has accounted for this deficiency in its supply planning process and intends to address this shortfall through the use of Other Purchased Resources (Tr. at 22-23; Exh. KED-1, at 76). The Department further notes that the deficiency only amounts to approximately 0.9 percent and 1.9 percent of total design season requirements under the base-case and high demand case scenarios, respectively (Exh. KED-1, Table G22-D Revised).<sup>26</sup>

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<sup>25</sup> The Company states that its forecasts assume that the long-term capacity associated with both the ConneXion project and the Algonquin Gas Transmission Company companion contract would be added to its resource portfolio (Company Brief at 30-31).

<sup>26</sup> The deficiency is calculated by comparing Other Purchased Resource Requirements for all of KeySpan's Massachusetts' service areas and comparing the figures to the total resource requirements provided in each of the Exhibit KED-1, G22-D tables.

Since the implementation of Federal Energy Regulatory Commission (“FERC”) Order No. 636, LDCs have been able to procure spot commodities when the need for such purchases arises. The Department recognizes, therefore, that KeySpan’s use of Other Purchased Resources allows the Company to strike a balance between the security of having all resources that might potentially be required in every possible design condition under firm contracts and the higher costs associated with having such security. The Department finds that there is minimal risk associated with the Company entering the 2006-2007 heating season.

On the matter of the possibility of delays in the in-service date of the ConneXion project and the impact delays might have upon the Company’s Supply plan, the Department addresses the Attorney General’s concern in Section III.F.4., below. Regarding the possibility that a specific area of the Company’s service territory may be disproportionately affected by the identified design year deficiency, the Department finds that (1) there is insufficient evidence in the record to support the examination of this topic, and (2) as mentioned above, KeySpan is positioned to meet any such deficiencies with short-term firm arrangements and market area purchases.

Therefore, based on KeySpan’s sendout and supply tables, the Department finds that the Company has demonstrated that it has adequate supplies through various sources to meet its forecasted sendout requirements under normal year and design year conditions throughout the forecast period.



2. Design Day Adequacy

a. Description

KeySpan plans to meet its design day needs through existing firm pipeline supplies, underground-storage, LNG, and propane injections (id. at 64). KeySpan forecasts that design day firm sendout requirements will increase from 1,270 BBtus in the 2005-2006 heating season to 1,384 BBtus in the 2009-2010 heating season (id. Table G-23D).

b. Positions of the Parties

i. Attorney General

The Attorney General claims that the Company's table depicting projected design day requirements identifies a capacity deficiency in the Company's Cape Cod service area beginning in the first year of the forecast period (Attorney General Brief at 5). The Attorney General also states that the deficiency grows throughout the forecast period despite the addition of the Tennessee capacity from the ConneXion project (Attorney General Brief at 5).

ii. The Company

The Company acknowledges that, notwithstanding the addition of the volumes associated with the ConneXion project, design day loads are forecasted to increase by approximately 25,000 MMBtus per day per year of the forecast period, or by more than 100,000 MMBtus per day over the forecast period (Exh. KED-1, at 84). The Company asserts, however, that the addition of the long-term capacity associated with the ConneXion project, as well as that of the Algonquin Gas Transmission Company ("Algonquin") companion contract, sufficiently increases KeySpan's resource portfolio to the point where it

can meet design day load requirements under base-case and high demand case scenarios (Company Brief at 30-32). Under the base-case scenario, the Company claims that the need for Other Purchased Resources to meet design day sendout requirements is entirely eliminated from the remainder of the forecast period after the 2006-2007 season (Company Brief at 31). Similarly, under the high demand case, the Company states that after the 2006-2007 season, the need for Other Purchased Resources to meet design day sendout requirements is eliminated until the 2009-2010 season (Company Brief at 31).<sup>27,28</sup>

c. Analysis and Findings

The Company's filing indicates a slight design day deficiency during 2006-2007 under design conditions. The Department notes that the Company has accounted for this deficiency in its supply planning process and intends to address this shortfall through the use of Other Purchased Resources (Exh. KED-1, at 80). The Department further notes that the deficiency amounts to approximately 1.3 percent and 2.9 percent of total design requirements under the base-case and high demand case scenarios, respectively (id. at Table G23-D Revised).<sup>29</sup> For the same reasons identified by the Department in Section III.E.1.c., the Department finds that

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<sup>27</sup> The Company explains that volumes in excess of the ConneXion and Algonquin supplies will be required at that point to meet design day sendout requirements (Company Brief at 31).

<sup>28</sup> In addition, under the high demand case, the amount of Other Purchased Resources needed to meet design year requirements is significantly greater than that relied upon in the base case (Company Brief at 31).

<sup>29</sup> The deficiency is calculated by comparing Other Purchased Resource Requirements for all of KeySpan's Massachusetts' service areas to the total resource requirements in each of the G23-D tables in Exhibit KED-1.

it is acceptable for the Company to enter the 2006-2007 heating season with a slight design day deficiency that will be addressed via the use of Other Purchased Resources and eliminated in the upcoming heating seasons.

Regarding the Attorney General's assertion that there will be a deficiency despite the addition of the volumes associated with the ConneXion project, the Department notes that the Attorney General does not take into consideration the capacity associated with the Algonquin contract. The record shows that the acquisition of both of these resources adequately prepares the Company to meet design day sendout requirements starting in the 2007-2008 heating season.

Therefore, based on KeySpan's sendout and supply tables, the Department finds that the Company has demonstrated that it has adequate supplies through various sources to meet its forecasted sendout requirements under design day conditions throughout the forecast period.

3. Cold-Snap Adequacy

a. Description

As stated above, KeySpan generated a fourteen-day cold-snap scenario with a probability of occurrence of once in 50 years (Exh. KED-1, at 82; Tr. at 57). KeySpan explained that the Company's portfolio can meet the cold-snap requirement in all the years of the forecast (Exh. KED-1, at 82-83). The Company's filing demonstrated that its existing supply resources could satisfy such a contingency (id., Table G-22N).

b. Analysis and Findings

Based on the Company's analysis, the Department finds that KeySpan has demonstrated that it has adequate supplies to meet its firm sendout requirements during a prolonged cold-snap. The Department finds the cold-snap planning standard to be reviewable, appropriate, and reliable.

4. Conclusions on the Adequacy of the Supply Plan

The Department finds that: (1) the normal year and design year supply plans are adequate to meet the Company's forecasted sendout requirements through the forecast period; (2) the Company has demonstrated that it has adequate supplies to meet forecasted sendout requirements under design day conditions throughout the forecast period; and (3) the Company has demonstrated that it has adequate supplies to meet its firm sendout requirements during a prolonged cold-snap. Based on these subsidiary findings, the Department finds that KeySpan has identified adequate resources to meet its firm sendout requirements throughout the forecast period.

F. Supply Planning Process

1. Standard of Review

The Department has determined that a supply planning process is critical in enabling a utility company to formulate a resource plan that achieves an adequate, least-cost, and low environmental impact supply for its customers. The Berkshire Gas Company, D.P.U. 94-14, at 36 (1994); D.P.U. 93-13, at 70; 25 DOMSC 116, at 223; Boston Gas Company, 19 DOMSC 332, at 388 (1990). The Department has noted that an appropriate supply

planning process provides a gas company with an organized method of analyzing options, making decisions, and reevaluating decisions in light of changed circumstances.

D.P.U. 94-14, at 36; D.P.U. 93-13, at 70; 25 DOMSC 116, at 223; 19 DOMSC 332, at 388.

For the Department to determine that a gas company's supply planning process is appropriate, the process must be fully documented. D.P.U. 93-13, at 70; 25 DOMSC 116, at 223.

The Department's review of a gas company's method of identifying and evaluating resources focuses on whether the company: (1) has a process for compiling a comprehensive array of resource options -- including pipeline supplies, supplemental supplies, DSM, and other resources; (2) has established appropriate criteria for screening and comparing resources within a particular supply category; (3) has a mechanism in place for comparing all resources, including DSM, on an equal basis, i.e., across resource categories; and (4) has a process that, as a whole, enables the company to achieve an adequate, least-cost, and low environmental impact supply plan. D.P.U. 94-140, at 37; D.P.U. 93-13, at 70; 25 DOMSC 116, at 224; 19 DOMSC 332, at 54-55.

The Department reviews a gas company's five-year supply plan to determine whether it minimizes cost, subject to trade-offs with adequacy and environmental impact.

D.P.U. 94-140, at 37; D.P.U. 93-13, at 88; 25 DOMSC 116, at 236. A gas company must establish that the application of its supply planning process, including adequate consideration of DSM and consideration of all resource options on an equal basis, has resulted in the addition of resource options that contribute to a least-cost supply plan. D.P.U. 94-140, at 37; D.P.U. 93-13, at 83; 25 DOMSC 116, at 233; The Berkshire Gas Company, 14 DOMSC 107,

at 115 (1986). As part of this review, the Department requires gas companies to show, at a minimum, that they have completed comprehensive cost studies comparing the costs of a reasonable range of practical supply alternatives prior to selection of major new resources for their supply plans. D.P.U. 94-140, at 37; D.P.U. 93-13, at 89; 25 DOMSC 116, at 236; 1986 Gas Generic Order, 14 DOMSC 95, at 100-102 (1986).

## 2. Identification and Evaluation of Resource Options

The Company states that, as part of its contract renewal decision-making process, it performs a thorough review to identify the most appropriate source of supply to reliably meet the demand requirements of its firm customers in the most cost-effective manner (Exh. KED-1, at 75). The Company first will evaluate the need to maintain the contracts as part of its resource portfolio (id.). As part of this analysis, KeySpan will consider trends in transportation migration and the growth in transportation relating to new customers that have not been previously served by the Company, and are, therefore, exempt from capacity assignment (id.). Consistent with the requirements of the Company's terms and conditions, if KeySpan determines that the resource is needed to meet firm sendout requirements, KeySpan will notify competitive suppliers serving KeySpan customers and solicit their input on the contract-renewal decision (id.). The Company will then evaluate the cost of renewing the existing resource with the cost of replacing that resource with other available market options based on both price and non-price factors (id.).

3. Consideration of All Resources on an Equal Basis

KeySpan estimates DSM volume reductions of 459 BBtus per year on average during the forecast period (id. at 34). In order to compare DSM resources on an equal footing with supply-side resources, KeySpan utilized a spreadsheet (“Energy Efficiency Model”) developed in the NSTAR Energy Efficiency Collaborative to project DSM-related future energy savings (id.). KeySpan asserts that the Energy Efficiency Model is used to track costs and benefits relating to energy efficiency and market transformations (id.). Furthermore, in April of 2005, KeySpan updated the model to account for current assumptions relating to program costs, benefits, participation, the discount rate, and avoided natural gas costs (id.).

4. Positions of the Parties

a. Attorney General

The Attorney General argues that the Company’s current supply plan fails to meet the Department’s review requirements since the filing does not: (1) adequately plan for deficiencies that may occur during the forecast period due to the expiration of contracts currently in effect, and (2) provide sound analysis or evaluation of alternatives for those contracts up for renewal during the forecast period (Attorney General Brief at 3). The Attorney General asserts that the Company’s petition should be rejected and that the Department should compel the Company to provide a more open and transparent supply plan that clearly outlines decision-making procedures and planning analysis (Attorney General Brief at 3).

Specifically, the Attorney General asserts that the Supply plan does not provide sufficient contingency planning in the event that: (1) the expansion of the TGP, referred to as the ConneXion project, experiences any delays, or, (2) the anticipated companion contract with the Algonquin Gas Transmission Company that would transport volumes available through the ConneXion project to the Cape Cod service area fails to be negotiated (Attorney General Brief at 4-5).

The Attorney General further argues that the Supply plan identifies distribution-related deficiencies that may lead to low system pressures (Attorney General Brief at 5). The Attorney General refers to customer outages on the Cape Cod distribution system in East Dennis and Eastham during the extremely cold weather in 2004 as evidence for the need of distribution system upgrades (Attorney General Brief at 5). The Attorney General acknowledges the Company's intention to install a new pipeline segment to alleviate low pressure problems and that the pending ConneXion capacity will provide further relief. The Attorney General concludes, however, that since neither of these measures have yet to be executed, the Company's Supply plan is too vague and, therefore, should be modified prior to Department approval (Attorney General Brief at 5-6).

Finally, the Attorney General submits that while KeySpan engages in a number of transactions with its affiliates, the Company provides no evidence that it procured the services from these affiliates based on an open and competitive process (Attorney General Brief at 6-7). The Attorney General argues that the Department should, therefore, require KeySpan to update the economic and other qualifications of both KeySpan LNG and TransGas, Inc. by providing



the results of recent requests for proposals to support the Company's continued reliance on those affiliates (Attorney General Brief at 6-7).

b. The Company

The Company points out that while the Attorney General claims that it is impossible to determine whether or not the Supply plan provides the necessary least-cost resources, he fails to identify which particular aspect of the plan lacks sufficient detail in terms of "decision-making procedures" or "planning analysis" (Company Reply Brief at 1). The Company argues that: (1) the Department's review of the Company planning analysis occurs periodically through a supply plan proceeding and is referenced over the forecast period at the time that a resource is proposed for procurement, and (2) the Attorney General participates in these proceedings and is afforded a full opportunity to evaluate the Company's decision-making process (id. at 2).

Regarding the Attorney General's assertion that the Supply plan contains inadequate contingency planning, the Company states that it provided detailed information regarding supplemental resources that it has procured, or intends to procure, during the term of the Supply plan (id. at 3). The Company claims that the ConneXion project will be on-line by the in-service date. In the event that the ConneXion project is in fact delayed by one year, the Company outlined its contingency plan to meet customer requirements through the use of domestic or Canadian LNG (Exh. KED-1, at 83; Exh. AG 1-12). Regarding the Attorney General's argument that KeySpan failed to provide a contingency plan in the event that it does not enter into a contract with Algonquin, the Company notes that it finalized a precedent

agreement with Algonquin on March 30, 2006, filed a petition<sup>30</sup> with the Department on June 23, 2006 seeking approval of a firm contract with Algonquin (Company Reply Brief at 3).

The Company also asserts that it has adequately addressed the matter of distribution system upgrades to its Cape Cod service area. KeySpan also states that it has filed an application with the Energy Facilities Siting Board (“EFSB”) for approval of a new pipeline segment in that service area (id. at 3, citing Colonial Gas Company d/b/a KeySpan Energy Delivery New England, EFSB 05-2 (2006)).

With regard to affiliate services, the Company points out that its agreement with KLNG for LNG storage service represents a continuation of the Company’s agreement with Algonquin LNG, the predecessor to KLNG (id. at 4). The Company further notes that the KLNG agreement is a longstanding one that is regulated by the FERC. The Company also argues that the agreement concerning LNG trucking services provided by TransGas does not require Department approval pursuant to G.L. c. 164, §§ 94A or 94B because: (1) the term of the agreement is less than one year, and (2) there is no Department precedent to indicate that LNG trucking constitutes the purchase of gas supply or capacity for the purposes of § 94A (Company Reply Brief at 4). The Company further notes that TransGas is the only company doing business in New England with sufficient resources to serve KeySpan’s LNG trucking needs (id.).

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<sup>30</sup> The petition was docketed as D.T.E. 06-54.

## 5. Analysis and Findings

The Department has held that for a gas company's planning process to minimize cost, that process must adequately consider alternative resource additions, including DSM options, on an equal basis. D.P.U. 93-13, at 83; 25 DOMSC 116, at 233. The record shows that the Company evaluated options across resource groups using industry-accepted standards (Exh. KED-1, at 34). Accordingly, the Department finds that KeySpan has incorporated both supply-side and demand-side options in its resource mix.

In addition, the Company has demonstrated that its resource planning process enables KeySpan to acquire least-cost supplies that are consistent with expressed portfolio objectives. Accordingly, the Department finds that the Company has formulated an appropriate process for the identification of a comprehensive array of supply options and has developed appropriate criteria for screening and comparing supply resources.

The Attorney General argues that the Company's current Supply plan should be rejected due to an inadequate contingency analysis and an absence of evidence demonstrating that KeySpan procured services from its affiliates in an open, competitive, and transparent manner. The Department notes that we require utilities to demonstrate that they have action plans that allow them to meet projected sendout in the event that the identified resources will not be available when expected. Colonial Gas Company, D.P.U. 96-18, at 31 (1996); Commonwealth Gas Company, D.P.U. 92-159, at 54 (1995). The record clearly shows that the Company has developed alternative plans to meet demand in the event that the ConneXion-related supplies are not available (Exh. KED-1, at 76).

With regard to the Algonquin capacity contract and distribution system upgrades to the Cape service territory, the Department finds that the Company has taken appropriate steps to reasonably demonstrate that this supply, combined with system improvements, is likely to be in place by the required dates. Since the time of the Company's initial filing, the Company finalized a precedent agreement with Algonquin and filed a petition with the Department on June 23, 2006 seeking approval of a firm contract with Algonquin (Company Reply Brief at 3). While the outcome of the Department's decision in D.T.E. 06-54 cannot be anticipated, the Department finds that, in this instance, the successful execution of a precedent agreement with Algonquin is sufficient to allow the Company to proceed, for the time being, under the assumption that the resource will be available to transport ConneXion-related volumes once that project is completed.

Further, regarding the KLNG agreement, the Department recognizes that it is a continuation of an agreement entered into with KLNG's predecessor. However, the Department notes that while KLNG's agreements and tariffs fall under FERC's jurisdiction, the Department is required by law to review all commodity and capacity agreements entered into by jurisdictional LDCs. Therefore, the Department directs KeySpan to provide in its next Forecast and Supply Plan filing, an analysis showing that the KLNG agreement is the best option available to the Company.

Finally, regarding the LNG transportation agreement with TransGas, the Department notes that presently TransGas is the only provider capable of transporting the required LNG to the Company's facilities. However, the Department directs the Company, in its next Forecast

and Supply Plan filing, to provide a review of the LNG transportation market to determine whether TransGas continues to be the only LNG transporter capable of providing the service required by KeySpan.

G. Conclusions on the Supply Plan

The Department finds that the Company has developed an appropriate supply planning process. Specifically, the Company has: (1) formulated an appropriate process to identify a comprehensive array of supply options and has developed appropriate criteria for screening and comparing resources; (2) formulated an appropriate process for identifying a comprehensive array of DSM options and has developed appropriate criteria for screening and comparing DSM resources; and (3) incorporated both supply-side and demand-side options in its resource mix. Further, KeySpan has compared all resources, including DSM, on an equal basis.

The Department also finds that the Company has established that its normal year, design year, design day, and cold-snap supply plans are adequate to meet the Company's forecast sendout requirements throughout the forecast period. In addition, the Department finds that the Company has developed: (1) appropriate criteria for screening and comparing supply-side resources and demand-side resources, and (2) a mechanism to undertake the comparison of resources on an equal basis.

Finally, the Department finds that the Company's supply planning process as a whole may contribute to and may lead to a least-cost supply plan. Accordingly, the Department

approves the Company's supply plan for the forecast period of November 1, 2005 through October 31, 2010.

IV. ORDER

Accordingly, after due notice, hearing, and consideration, it is hereby

ORDERED: That KeySpan Energy Delivery New England's petition for approval of its load forecast and supply plan be and hereby is APPROVED; and it is



An appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the Order of the Commission be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the Clerk of said Court. G.L. c. 25, § 5.



**Attachment A - KeySpan Energy Delivery of New England Transportation Contracts**

<b>Pipeline Company</b>	<b>Citygate MDQ (MMBtus)</b>	<b>Annual Quantity (MMBtus)</b>
Algonquin	363,412	110,192,766
Dominion	15,200	5,548,000
HubLine	20,000	7,300,000
Iroquois	51738	18884370
Maritimes Canada	43,200	15,768,000
Maritimes USA	43,200	15,768,000
National Fuel	6,203	2,264,095
Tennessee	347033	126667045
Texas Eastern	198609	72492285
Texas Gas	13,280	4,847,200
Transco	6,912	2,522,880
<b>Totals</b>	<b>1,108,787</b>	<b>382,254,641</b>

(Exh. KED-1, at Section V)

**Attachment B - KeySpan Energy Delivery of New England Underground-Storage Contracts**

<b>Company</b>	<b>Citygate MDWQ (MMBtus)</b>	<b>Annual Quantity MSQ (MMBtus)</b>	<b>Expiration Date</b>
Dominion	42,457	4,698,132	3/31/2011
Dominion	2,222	222,200	3/31/2012
Dominion	104	10,400	4/1/2012
Dominion	11,000	823,529	4/2/2012
Honeoye	6,150	981,120	4/1/2007
KeySpan KLNG	35,000	1,159,664	10/31/2007
National Fuel	6,203	930,450	3/31/2007
Tennessee	70,799	5,686,054	10/31/2008
Tennessee	14,150	1,095,830	10/31/2008
Tennessee	10,466	821,406	10/31/2008
Texas Eastern	68,771	4,938,091	4/30/2013
Texas Eastern	6,969	493,486	4/30/2013
<b>Totals</b>	<b>274,291</b>	<b>21,860,362</b>	<b>-</b>

(Exh. KED-1, at Section V)

**Attachment C - KeySpan Energy Delivery of New England Off-System Supplemental Resources**

<b>Contract</b>	<b>Description</b>	<b>MDQ (MMBtus)</b>	<b>ACQ (MMBtus)</b>	<b>Contract Termination Date</b>
KLNG	Firm Storage	35,000	1,159,664	10/31/2007
Distrigas	n/a	30,000	1,000,000	n/a
Distrigas	Firm Combination Service	6,000	906,000	10/31/2010
Distrigas	Firm Combination Service	15,000	3,335,000	10/31/2010
Distrigas	Firm Liquid Service	n/a	1,000,000	3/31/2010
Distrigas	Firm Liquid Service	n/a	3,500,000	10/31/2011
<b>Totals</b>	<b>-</b>	<b>86,000</b>	<b>10,900,664</b>	<b>-</b>

(Exh. KED-1-1, at 69)

**Attachment D - KeySpan Energy Delivery of New England On-System Supplemental Resources**

<b>Location</b>	<b>Facility Type</b>	<b>Maximum Vaporization (MMBtus/day)</b>	<b>Storage Capacity (MMBtus)</b>
Commercial Point	LNG	198,968	1,192,345
Lynn	LNG	91,542	1,045,000
Salem	LNG	31,768	1,045,000
Tewksbury	LNG	68,343	1,045,000
Westford	LNG	6,270	4,180
South Yarmouth	LNG	24,871	179,740
Wareham	LNG	4,494	4,180
Haverhill	LNG	41,069	418,000
Spencer	Propane	3,240	1,401
Southbridge	Propane	2,565	11,672
Norwood	Propane	4,050	14,240
Danvers	Propane	3,510	11,672
Lowell	Propane	9,180	44,467
Haverhill	Propane	n/a	42,215
<b>Totals</b>	<b>-</b>	<b>489,870</b>	<b>5,059,112</b>

(Exh. KED-1, at 70)

**G.L.c. 164, § 69I. Long-range forecasts of electric power and gas needs of market area, filing; construction of electric, gas, or oil facility; filing of notice of intention, approval.**

Section 69I. The department shall approve or reject long-range plans; provided, however, that a long-range plan submitted in conjunction with a petition to construct a facility may be referred to the board for review and approval or rejection in accordance with section sixty-nine J. Every electric company, except municipal corporations authorized to operate a municipal lighting plant under the provisions of sections thirty-four to thirty-six, inclusive, shall file with the department a long-range forecast with respect to the electric power needs and requirements of its market area, taking into account wholesale bulk power sales or purchases or other cooperative arrangements with other electric companies, for the ensuing ten-year period. Such forecast shall be filed at least every two years.

Every gas company, except municipal corporations authorized to operate a municipal gas plant under the provisions of sections thirty-four to thirty-six, inclusive, shall file with the department a long-range forecast with respect to the gas requirements of its market area, taking into account wholesale bulk gas sales or purchases or other cooperative arrangements with other gas companies, for the ensuing five-year period. Said forecast of gas requirements shall consist of the gas sendout necessary to serve projected firm customers, and the available supplies, for the ensuing five-year period. Such forecast shall be filed at least every two years.

As regional plans covering longer time periods are developed, they shall be filed with the department. Neither said department, the board, nor any other person shall, in taking any action pursuant to sections sixty-nine I through sixty-nine J be subject to any of the provisions of sections sixty-one to sixty-two H, inclusive, of chapter thirty.

As regional plans covering longer time periods are developed, they shall be filed with the department. Neither said department, the board, nor any other person, in taking any other person in taking any action pursuant to sections 69I to 69J 1/4, inclusive, shall be subject to any of the provisions of sections 61 to 62H, inclusive, of chapter 30.

The department or board shall conduct a public hearing on every long-range forecast within six months of the filing thereof. Such hearing shall be an adjudicatory proceeding under the provisions of

chapter thirty A. The department or board shall within twelve months from the date of filing approve a long-range forecast if it meets the following requirements: all information relating to current activities, environmental impacts, facilities agreements and energy policies as adopted by the commonwealth is substantially accurate and complete;

projections of the demand for electric power, or gas requirements and of the capacities for existing and proposed facilities are based on substantially accurate historical information and reasonable statistical projection methods and include an adequate consideration of conservation and load management; provided, however, that the department or board shall not require in any gas forecast or hearing conducted thereon the presentation of information relative to the demand for gas; projections relating to service area, facility use and pooling or sharing arrangements are consistent with such forecasts of other companies subject to this chapter as may have already been approved and reasonable projections of activities of other companies in the New England area; plans for the expansion and construction of the applicant's new facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the commonwealth; and are consistent with the policies stated in section sixty-nine H to provide a necessary energy supply for the commonwealth with a minimum impact on the environment at the lowest possible cost.

If the department or board determines the standards set forth above have not been met, it shall within twelve months of the date of filing reject in whole or in part the long-range forecast setting forth in writing its reasons for such rejections, or approve the long-range forecast subject to stated conditions. In event of rejection or conditioned approval, the applicant or individual company may within six months submit an amended forecast. A public hearing on the amended forecast shall be held on the same terms and conditions applicable to the original forecast.

The authority of the department and board to conduct public hearings under the provisions of this section may be delegated in whole or part to employees of the department. Pursuant to the rules of the department and board, employees of the department shall report back to the department or board with recommended decisions for final action thereon.

The department and the siting board shall prepare and file with the general court, by March first of each year, an annual report for the previous calendar year detailing the substance of all plans and forecasts filed pursuant to this section, any and all actions taken by the department pursuant to implementing the provisions of this section, and an analysis of the reliability and diversity of electric power and gas needs based on such filings with the department and decisions made and issued by the department.

The department is authorized to exempt any electric or gas company from any or all provisions of this section upon a determination by the department and the siting board, after notice and hearing, that an alternative process is in the public interest.