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COMPREHENSIVE ENERGY STRATEGY - GAS PROPOSALS

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You asked for information on the natural gas proposals in the Department of Energy and Environmental Protection's (DEEP) draft comprehensive energy strategy. You specifically asked:

1. how DEEP arrived at its estimate for the cost to customers for switching from oil to natural gas and whether this estimate appears to be reasonable;

2. how realistic is the draft strategy's projection of a 53% growth in the number of gas customers in the seven years it covers;

3. how much interstate pipeline delivery capacity Connecticut has and whether this capacity is sufficient to deliver gas to the new customers anticipated by the draft strategy, even with increased compression on existing pipelines; and

4. what is the position of the gas companies on these issues.

SUMMARY

As part of the draft strategy, mandated by PA 11-80, DEEP proposes a number of measures to encourage customers to switch from heating oil to gas. DEEP makes these proposals, in part, due to the fact that gas is currently less expensive than oil and DEEP's belief that this difference will

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likely continue. Among the specific proposals are (1) establishing a financing mechanism to help residential and business customers pay for replacement heating equipment such as furnaces and (2) expanding gas distribution mains.

The draft strategy provides estimates for the following costs associated with fuel switching: (1) replacement heating equipment, (2) service lines and meters for those customers who do not already use gas for such things as cooking, and (3) distribution mains. Under existing Public Utilities Regulatory Authority (PURA) policy, all customers (existing and new) pay for gas meters and, in most cases, for service lines. The allocation of costs for new distribution mains between new and existing customers depends on their projected revenues.

According to the draft strategy, the average cost for heating equipment would be $7,500 for residential customers, $20,300 for commercial customers, and $40,600 for industrial customers. DEEP derived these estimates from a study conducted by the Department of Economic and Community Development (DECD) that was sponsored by the gas companies (Connecticut Natural Gas, Southern Connecticut Gas, and Yankee Gas Services). The residential cost estimates are consistent with data provided by a small survey of heating equipment contractors conducted by DEEP.

There does not appear to be a significant debate regarding the cost estimates for the service lines, meters, and distribution lines. But a number of individuals and entities have challenged DEEP's costs estimates for the heating equipment.

The heating equipment cost estimates appear to be reasonable, but they are averages. The actual costs for individual customers could vary substantially, based on such things as the size of the building to be served and the equipment's energy efficiency. In addition, the draft strategy does not address a number of incidental costs of fuel switching that might be allocated to individual customers.

DEEP estimates that its proposals would increase the number of gas customers by 53% over seven years. The number of customers switching from oil to gas has increased substantially in recent years, but the number of conversions per year would need to more than double to achieve this growth. Some of the factors that could affect the pace of fuel switching are in the hands of state policy-makers, such as the attractiveness of financing offered to customers who switch. Other factors are not. These include the relative prices of oil and gas and whether the interstate pipeline system is expanded to serve new customers in the state.

The three interstate pipelines that currently serve Connecticut can deliver about one million dekatherms (a dekatherm is about 1,000 cubic feet of gas) per day. This is sufficient to serve all firm (residential and other non-interruptible) current customers, as well as interruptible customers most of the time. The gas companies believe that the current system, together with planned capacity expansions of the existing pipelines, could meet the demands of the current pace of conversions. However, the draft strategy notes that substantially expanding gas use in the state would require expanding pipeline capacity by building new pipelines as well as by increasing capacity on existing pipelines by additional compression.

The three gas companies filed joint comments on the draft strategy in December 2012. They supported the proposals in the draft, addressed questions raised during the public sessions, and provided technical comments on DEEP's analysis. The companies believe that the draft strategy somewhat overstated the number of low-use gas customers (those who just use gas for cooking or water heating) who would likely convert to gas space heating. On the other hand, the companies believe that the draft strategy underestimates the value of fuel switching for commercial and industrial customers. While the companies agree that a substantial expansion in the number of gas customers would require new pipelines, they believe they can continue to add customers before these pipelines are built.

DRAFT COMPREHENSIVE ENERGY STRATEGY

PA 11-80 requires DEEP to develop a comprehensive plan (which it calls a strategy). The draft strategy, issued in October 2012, recommends increased use of natural gas in the state, primarily for heating buildings. It also recommends using natural gas in certain vehicle fleets.

The draft strategy notes that the price of gas and heating oil have diverged over the last several years. The emergence of fracking and other extraction technologies has brought enormous amounts of gas supply to the marketplace from the Marcellus basin in the northeast and other parts of the country. As a result, the average wholesale price of gas dropped from over $7 per million British Thermal Units (BTUs) in 2007 to below $3 per million BTU in early 2012 (when the draft was being prepared), with prices projected to remain low for the foreseeable future. In that same time, the average wholesale price of oil rose from $12 to over $16 per million BTU (averaging $96 per barrel in early 2012). The draft strategy projects that oil prices will remain high due to growing global demand for oil.

In spite of the price difference, only 31% of the state's residents use gas for space heating. That percentage is lower than the rest of New England and the U.S. average, which are both about 50%. The draft strategy argues that

so few customers heat with gas primarily due to the significant upfront cost of installing gas heating equipment. In addition, for homes and businesses located more than 150 feet from a gas main, the cost of extending the main may substantially exceed the cost of the new heating equipment.

DEEP estimates that more than half (52%) of residential and 75% of commercial and industrial oil customers are plausible candidates for switching to gas. DEEP splits these customers into two groups. The first consists of customers who (1) already use gas for cooking or water heating but have oil space heating systems or (2) do not currently use gas but are within 150 feet of gas mains. The draft strategy estimates that there are approximately 200,000 residential and 16,700 commercial and industrial customers in this group. The second group consists of customers who are not served by gas and are more than 150 feet away from a gas main, but who could economically be served with extensions of mains. The draft strategy estimates that there are approximately 51,500 residential and 37,700 commercial and industrial customers in this category. The draft strategy puts forward a seven-year plan to expand natural gas use across Connecticut with a goal of providing approximately 300,000 Connecticut homes, businesses, and other facilities with access to gas.

The draft strategy recommends:

1. providing financing to homeowners and businesses to eliminate the upfront cost of converting heating equipment to gas, with the cost initially funded by banks and capital markets and repaid over 10 years through the customer's gas bill;

2. offering alternative financing for low-income homeowners through community banks and credit unions with the state providing incentives or financing through the Clean Energy Finance and Investment Authority;

3. making regulatory changes, such lengthening the period in which systems expansions must pay for themselves, to enable potential gas customers who are near gas mains to have their connections financed by the gas companies and repaid through the added revenues of the new customers; and

4. encouraging the construction of approximately 900 miles of gas mains, focusing on giving access to gas mains to "anchor loads" such as factories, hospitals, schools, or other facilities with significant energy consumption.

COSTS OF FUEL SWITCHING

Cost Estimate

Appendix C of the draft strategy explains how DEEP derives its cost estimates. The cost for converting a customer from oil to gas includes: (1) heating equipment replacement, (2) installing a service line to connect to the gas main and a meter for those customers who do not currently use any gas, and (3) in some cases, extending the main. Heating equipment replacement costs include removing and disposing of old heating equipment (including the oil tank), purchasing new heating equipment (a furnace or boiler and hot water heater), labor, and installation. According to the draft strategy, the average cost of the heating equipment would be $7,500 for residential customers, $20,300 for commercial customers, and $40,600 for industrial customers.

The heating equipment costs were taken from the 2011 DECD report. For residential conversions, DEEP also received quotes from five heating equipment installers located in Bridgeport, East Hartford, South Windsor, Plainfield, and Stonington. The costs were roughly consistent with those in the DECD study, except that the South Windsor firm's estimate was noticeably lower.

Except for existing low-use gas customers (those who just use gas for cooking or water heating), switching from oil to gas requires a service line and meter. The draft strategy estimates that the average service line and meter costs would be $4,283 for residential customers, $7,669 for commercial customers, and $11,504 for industrial customers. Typically, new customers do not pay for the service line unless it is unusually long (more than 75 or 100 feet, depending on the gas company) or there are site-specific conditions such as ledge near the surface. The new customer also does not pay for the cost of the meter. Under existing PURA policy, the costs of the service line and meter are generally borne by all gas company ratepayers.

For customers who are not located on a main, switching from oil to gas would require a main extension that the draft strategy estimates would cost approximately $1.03 million per mile. Currently, when a gas company proposes to extend its mains, PURA projects how much additional distribution revenue the new line would generate. (The distribution revenue comes from the company's charge for shipping the gas to the customer, which is distinct from the cost of the gas itself.) Under existing PURA policy, if the projected distribution revenue over a 20-year period (15 years in the case of Yankee Gas Services) equals or exceeds the cost of the new main, all company customers pay for the extension. To the extent that projected revenues fall short of the extension cost, the customers who would benefit

from the extension must pay for the shortfall. The strategy proposes increasing the period of the analysis to 25 years for all three companies, which will potentially increase the number of main extensions that are funded by all ratepayers.

Discussion

There appears to have been little debate on the cost estimates for the service lines, meters, and main extensions. As noted above, the companies routinely add customers who need service lines and meters. In addition, Yankee Gas Services completed a main connecting Waterbury and Wallingford in 2011, which provides a baseline for the costs of further main extensions.

On the other hand, a number of people commenting on the draft strategy challenged the heating equipment replacement cost estimates as being too low; some of these individuals were heating oil dealers who install gas as well as oil heating equipment. A consultant for the dealers' trade association also noted that the draft strategy did not account for certain incidental costs that may be required for conversions in some cases, e.g., chimney relining. The draft strategy contains a number of sensitivity analyses looking at varying trends of oil and natural gas prices, among other things. It does not have a scenario where the cost of replacement heating equipment is higher than discussed above.

As noted above, the heating equipment cost estimates in the draft strategy are averages. It is possible that they are correct, even though those challenging them are accurately reflecting their experience. Converting from oil to gas involves a substantial out of pocket expenditure. It seems reasonable to assume that households that are currently converting have higher incomes, larger homes, and larger lots than those that have not switched. All of these factors are likely to be correlated with higher conversion costs. Higher income households are likely to be more willing to pay for high efficiency equipment, which has a higher initial cost than less efficient equipment. Larger homes require heating equipment with greater capacity than smaller homes, and larger lots increase the length of the service line, which may require a customer contribution to its cost.

The draft strategy also does not appear to address several costs associated with the proposed programs that would be borne by all gas customers. The infrastructure expansion contemplated in the draft strategy would require an increase in the workforce that designs and constructs this

infrastructure. Similarly, increasing the number of customers will increase the need for customer service staff. The draft strategy also did not include other capital investments or expense increases related to the increase in the number of customers and sales.

GROWTH IN GAS CUSTOMERS

According to the gas companies, about 17,000 customers switched from oil to gas in 2012. They anticipate that the number of conversions in 2013 will exceed 20,000. The draft strategy anticipates that its proposals would add 305,000 new firm gas company customers over seven years. This is about 43,600 conversions per year, or more than double the number anticipated in 2013. This would represent a 53% increase over the number of existing customers over seven years, according to comments filed by PURA on January 24, 2013.

Among the issues that could affect the number of oil-heated households and businesses that convert to gas are:

1. future trends in the price of gas vs. oil,
2. the ability of individual customers to switch back to oil,
3. the interest rate charged on financing conversions,
4. the extent to which the gas companies expand their distribution mains,
5. the degree to which capacity on the interstate pipeline system increases, and
6. the overall economy.

Some of these factors, such as the interest rate charged on financing conversions, are controlled by state policymakers. Others are not. In particular, as discussed below, any substantial growth in the number of gas customers above the current trend line would require an expansion of the interstate pipeline system. This system is privately owned and subject to federal, rather than state, economic regulation. Oil prices are set by a global market and have been highly volatile in the past.

PIPELINE CAPACITY

The Connecticut gas companies are served by three interstate pipelines (Algonquin, Iroquois, and Tennessee) that bring gas from producing regions. The interstate pipelines are under the jurisdiction of the Federal Energy Regulatory Commission (FERC) with regard to their rates and other economic factors.

There is currently about one million dekatherms per day of capacity on the three pipelines serving the state. This is enough pipeline capacity to serve the demand of firm gas customers in Connecticut. These are residential customers and those business customers that buy gas on a non-interruptible basis. Most of the time, there is also enough pipeline capacity to serve existing "interruptible" customers. These are non-residential customers who choose to take service on an interruptible basis in exchange for lower rates. These are typically larger business customers, including power plants. Particularly during peak demand periods, the pipeline infrastructure serving much of New England is fully utilized and service to these customers can be and is interrupted. Many of these customers have the capacity to use other fuels such as heating oil.

The draft strategy notes that substantially expanding gas use in the state would require expanding pipeline capacity by building new pipelines as well as increasing compression on existing pipelines. This position was supported by a number of participants in the process of drafting the draft strategy, including Algonquin. Algonquin is developing the AIM project to expand the capacity of its existing pipeline system. The project specifically targets Connecticut and other New England regional gas markets. The project is designed to transport gas produced in the northeast from pipeline connections with the Tennessee pipeline at Mahwah, New Jersey and the Millennium pipeline at Ramapo, New York. Algonquin anticipates that the earliest possible in-service date for the project would be November 1, 2016. In addition, the Williams Pipeline Company has proposed to build a new pipeline to bring Marcellus shale gas into the Iroquois pipeline at Wright, New York and transport the gas into Connecticut, New York City, and Long Island.

In its comments on the draft strategy, PURA, which regulates the gas companies, stated that "historically, there has been limited primary firm capacity available on the interstate pipelines into New England to meet the needs of additional usage over and above firm contracts on the peak winter day." PURA stated that the potential to convert existing non-heating

customers to heating customers should be explored prior to significant system expansions. The Office of Consumer Counsel raised concerns about the strict limits that the current pipeline infrastructure places on additional winter use.

PURA also notes that the increasing use of gas by power plants and distributed (on-site) electric generation has significantly increased summertime gas demand. ISO-New England, which administers the wholesale electric market (which relies heavily on gas), commissioned ICF International to assess the New England pipeline system's capacity to satisfy short and near-term power generation needs. The assessment, published in June 2012, observed that gas supply capabilities are adequate to meet firm gas demand. On the other hand, the study and ISO-New England have expressed concerns about the pipeline system's capacity to simultaneously meet the future needs of firm and interruptible customers, most notably power plants.

The ICF study notes that, as a result of planned capacity expansions of the existing pipelines, New England's winter peak day capability will increase from 5.7 million dekatherms per day to about 6.1 million dekatherms per day by 2016.

In its comments on the draft strategy, Algonquin states that pipeline companies will not build, nor will FERC approve, projects based on the assumption that there will be a future market for pipeline services. Capital investments in pipeline infrastructure must be supported by market demand and revenue from firm service agreements.

GAS COMPANY POSITIONS

The three gas companies filed joint comments with DEEP on the draft strategy on December 21, 2012. They supported the proposals in the draft, addressed questions raised during the public sessions, and provided technical comments on DEEP's analysis.

The companies state that this (2012-2013) winter season, the price of residential heating oil is more than twice that of natural gas ($4 per gallon, equivalent to $28.40 per thousand cubic feet (mcf), compared to approximately $13 per mcf for gas). They note that this is the seventh year in a row that natural gas prices have been lower than oil.

While the gas companies acknowledge that commodity prices vary over time, they argue that the supply of gas exceeds consumption so that gas is now priced based on its cost of production, rather the price of oil. They believe that domestic natural gas prices are likely to continue to be disconnected from global energy prices for the foreseeable future in light of oil demand growth in developing nations. The companies acknowledge a concern that U.S. gas prices could increase towards worldwide prices as liquefied natural gas (LNG) facilities are built, allowing for exports of U.S. gas. But they cite a U.S. Department of Energy study's findings that the 15 LNG facilities currently seeking approval would not significantly affect this price disconnection if approved.

The companies believe that the draft strategy overstates the number of low-use customers that could be converted to gas. In response to question by DEEP, the companies noted that many such customers live in large apartment buildings where the heat is supplied by a central boiler that is not under the tenants' control. In addition, surveys conducted by some of the companies found that 25% of other low-use customers do not have any interest in converting to gas. As a result, the companies believe that only 46% of the total low-use customers are plausible candidates for fuel switching. On the other hand, the companies believe that the draft strategy underestimates the value of switching for commercial and industrial customers, potentially underestimating the number of such customers who would switch fuels.

In response to questions posed by PURA, the companies stated that their current demand forecast for their firm customers projects a need for new pipeline capacity. According to the companies, the draft strategy would accelerate and increase this need. They stated that they are confident that the new capacity can be obtained and placed into effect at reasonable cost to fulfill reliability requirements and the goals of the draft strategy.

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