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MEMORANDUM

To: Public Service Commission

From: Division of Public Utilities
Constance B. White, Director
Energy Section
Marlin H. Barrow, Utility Analyst
Carolyn Roll, Utility Analyst
Artie Powell, Manager

Date: December 22, 2006

Subject: Action Request Docket No. 05-057-T01 Questar Gas DSM Program Tariffs.

ISSUE:

On December 5, 2006, Questar Gas Company (QGC) filed an application with the Utah Public Service Commission (PSC) for expedited approval of Demand Side Management (DSM) programs as well as a Market Transformation Initiative.

RECOMMEND APPROVAL:

The Division has reviewed the Application as filed and recommends to the Commission the approval of the DSM programs as filed.

DISCUSSION:

History:



This application is the product of a collaborative effort of interested parties working with QGC to provide input and design programs that will benefit QGC's GS customers with concrete dollar savings by reducing their usage of natural gas through programs designed to improve the efficiency of the customer's natural gas usage. It is a process that began in earnest with QGC's CET application to the PSC on December 16, 2005 in Docket No. 05-057-T01. Subsequent to that initial filing in Docket No. 05-057-T01, there were technical conferences and numerous meetings which occurred between parties in that case.

During this period, an informal DSM working group was created. This working group, which consisted of members representing the Public Service Commission, Committee of Consumer Services, the Division, Questar Gas Company, Salt Lake CAP, Utah Weatherization, SWEEP, Utah Clean Energy, Utah Governor's Office, Dept. of Natural Resources and Energy Strategies met on seven separate occasions beginning March 1, 2006 through September 21, 2006. In this time period, initial work on developing DSM programs began and continued right on through to the time when the PSC, in an order issued on October 5, 2006, established a formal DSM Advisory Group and gave QGC 60 days to present to the PSC, DSM programs for their review.

That Advisory Group, which essentially was a continuation of the DSM working group, met on November 1, November 21 and on December 1 of 2006 to review, refine and provide feedback to the work which QGC and its consultants, Nexant and Portland Energy Conservation, Inc. ("PECI") had put into the DSM program development. The results of those efforts were filed with the PSC on December 5, 2006 and are the subject of this Action Request of the PSC to the Division.

PROGRAM REVIEW

This filing established five (5) separate DSM programs, with four of the five programs containing multiple offerings or measures to customers, all of which are designed to help customers improve the efficiency of their natural gas consumption. The programs are (1)

a **Residential Appliance Program**, (2) an **Energy Star New Homes Program**, (3) a **Commercial Rebate Program**, (4) a **Residential Home Audit and Weatherization Program** and (5) **Low Income Weatherization Assistance Program**. In addition to these five distinct programs, there are also funds being requested for a **Market Transformation Initiative** which is designed to help educate customers to be more aware of the need to conserve natural gas usage as an ongoing mind set.

QGC, with the help of Nexant, has developed an Excel Model (DSM Model) which was used to evaluate the cost effectiveness of the measures within each program using the California Standard Practice Manual for the Economic Analysis of Demand-Side Programs and Projects dated October 2001¹. The four tests used in this model are the Ratepayer Impact Measure Test (RIM), Utility Cost Test (UCT), Participant Test (PT) and Total Resource Cost Test (TRC).

Based on the program data inputs as filed, all of the programs have benefit cost ratios of 1 or greater using the TRC test while the Residential Home Audit and the Low Income Weatherization programs had benefit cost ratios below one under the RIM test. The Division used the DSM Model provided in the filing to analyze the sensitivity of the tests for each program by varying the following inputs: (1) natural gas avoided cost; (2) Dth savings; (3) discount rate; and (4) participation levels. The range of sensitivities for each are as follows.

(1) **Natural Gas Avoided Cost** shows the dollar per Dth **decline** from the base cost assumptions before a particular measure fails a test. The range of dollars measured varied between \$1/Dth to \$4/Dth with \$0.50/Dth increments.

¹ QGC Application for Expedited Approval of Demand Side Management Programs and a Market Transformation Initiative; Docket No. 05-057-T01, ¶ 37 pp11

Base Case Assumptions[Error! Not a valid link.](#)

(2) **Dth Savings** - shows the percent of decline from the base case assumption. The range of the decline is from 10% to 50% with 5% increments.

(3) **Discount Rate** - show the effect of increasing the discount rate from the base of 7% up to 12% in 1% increments.

(4) **Participation Levels** – Discussed at end of analysis.

Inputs not measured were the Life Cycle Years, Customer Incentives, Customer Cost and Potential Customers. The Division has no basis to question the reasonableness of the data inputs since these inputs are the product of the expertise of QGC and the consultants Nexant and PECL.

In the analysis of the sensitivities of the measures, the Division assumes the base data used in each measure is reasonable and errs on the conservative side of achievable results. Also, it should be noted that the benefits derived in the analysis of these programs is based only on natural gas savings. Any externalities which may accrue such as reduced water usage or electrical power savings have not been taken into consideration in deriving the benefit cost ratios.

A note about the sensitivity analysis: Because of the many different measures and possible combinations that are possible, the Division performed the analysis assuming that the particular sensitivity is for all three years of the pilot program for each particular measure within a program as well as the total program and affects all measures within the program at the same time. The sensitivities shown indicate at what point a particular measure or the total program fails a particular test by achieving a negative NPV. The following is a discussion of each of these programs and the results of the sensitivities performed on the program.

RESIDENTIAL APPLIANCE PROGRAM

This program has six separate measures or choices that customers can take advantage of if they choose to upgrade their home appliances. The program will be administered by PEI and has a first year budget cost of \$1.9 million. \$1.4 million of this \$1.9 million is based on the level of participation and will change as participation varies from the base assumptions. \$0.5 million are first year program costs.

Sensitivities:

(1) Gas Costs- Decline from Base Case with \$1 to \$4 dollar range.

RAP Table 1 shows the dollar decline required from the base case natural gas avoided cost assumptions before a measure or total program will fail a test using a negative NPV-benefit/cost ratio of less than one- as the criteria for that particular test.**Error! Not a valid link.**

A \$1 dollar decline from the base case assumptions produced a negative NPV for both the Energy Star Clothes Washer Tier 1 & 2 under the TRC test. In other words, if the actual gas prices are \$1.00 less in each of the three years than those assumed in the base case (\$6.75, \$7.99 and \$8.09 for years 1, 2, and 3 respectively for the summer and \$8.45 for year 1, and \$9.57 for years 2 and 3 in the winter), then these two measures fail the TRC test. Only the High Efficiency Gas Water Heater and 90% Plus AFUE Condensing Gas Furnace passed all the tests within the measured sensitivity range. A decline of \$3.50 will cause the total program to fail the TRC and RIM test due to the inclusion of the program administrative costs.

(2) Dth Savings – Reduction from base levels with 10% to 50% range.

RAP Table 2 – indicates the required percentage decline from the assumed achievable base case Dth savings before a measure will fail a test by producing a negative NPV-benefit/cost ratio result for that particular test.**Error! Not a valid link.**

Again, both the Tier 1 & 2 Energy Star Clothes Washer are the most sensitive to a change in base case assumptions. The 90% Plus Gas Furnace still passes all tests even with a

50% decline in assumed Dth savings. A 30% decline fails the program under the TRC test due to the program costs while a 40% decline will fail under the RIM test.

(3) Discount Rate – Increase from base rate with 8% to 12% range.

RAP Table 3 – indicates the sensitivity to a change in the assumed 7% discount rate used in the base case.**Error! Not a valid link.**

The results of this test again show that the Tier 1 & 2 Clothes Washers are the most sensitive to a discount rate change, however it also shows that a change in the discount rate has the least impact on most of the measures. A 12% discount rate still provides a positive benefit/cost ratio for the entire program.

Observation: Even though the Tier 1 & 2 Clothes Washers were the programs that first failed all of the sensitivity tests, other externalities such as savings in water usage as well as possible electrical usage savings were not considered in these tests. Also the effect of using a combination of measures together is not considered. The Division feels that all of these measures offered in the Residential Appliance Program should remain as offerings in this initial DSM Pilot Program.

ENERGY STAR NEW HOMES PROGRAM

There are four measures in this program which range from a builder or builder/owner building a residential structure that meets the certification requirements for the Energy Star rating to the installation of furnaces and water heaters which meet the Energy Star rating requirements. The water heaters and furnace are the same measures offered in the Residential Appliance Program. This program will be administered by PECI and has a first year budget of \$2.8 million with \$2.1 million of variable costs based on the participation levels and \$0.7 million of first year program costs.

Sensitivities:

(1) Gas Costs- Decline from Base Case with \$1 to \$4 dollar range.

ES Table 1 shows the dollar decline required from the base case natural gas avoided cost assumptions before a measure will fail a test using a negative NPV as the criteria for that particular test.**Error! Not a valid link.**

The results show the Tank Less Water Heater has a negative NPV with a \$1.50 decline from the base case avoided gas cost levels, the same sensitivity noted under the Residential Appliance Program in RAP Table 1. However, the 90% Plus furnace shows a sensitivity to a \$3.50 decline under this program where as in the Residential Appliance Program it isn't sensitive. The reason for this variance is due to the difference in Dth savings between the two programs. The savings under the Energy Star Homes program is less due to the overall home structure being more energy efficient. A four dollar decline still has positive NPV-benefit/cost ratios.

(2) Dth Savings – Reduction from base levels with 10% to 50% range.

ES Table 2 – indicates the required percentage decline from the assumed achievable base case Dth savings before a measure will fail a test by producing a negative NPV result for that particular test. **Error! Not a valid link.** Again, the water heaters show the same sensitivities as those shown in RAP Table 2. The 90% Plus furnace shows a sensitivity to a 25% decline in Dth savings under the TRC test and a 45% sensitivity under the RIM test. A 30% decline in the Dth savings will fail the program under the TRC test because of the program costs while a 50% decline will fail the program under the RIM test.

(3) Discount Rate – Increase from base rate with 8% to 12% range.

ES Table 3 – indicates the sensitivity to a change in the assumed 7% discount rate used in the base case.

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The tank less water heater has the same sensitivity as the RAP Table 3 shows. The 90% plus furnace is sensitive to a 12% discount rate due again to the difference in Dth savings achieved between the Residential Appliance Program and the Energy Star Home Program. The total program will fail to pass the TRC test at a 12% discount due to the program costs.

Observation: The Division feels the Energy Star Program initiative is very important to begin changing the mindset of new home construction in Utah. Greater energy savings can be achieved through proper construction methods that emphasize energy saving techniques. The overall savings realized through lower energy costs more than offset the incremental cost of building a home to Energy Star specifications and the Division supports any initiatives which will help change this mindset in the home construction industry.

COMMERCIAL REBATE PROGRAM

This program offers twenty two measures which are available to commercial GS customers. The program will be administered by Nexant. The first year budget is \$261 thousand of which \$76 thousand is based on participation levels and \$185 thousand for program costs.

Sensitivities:

(1) Gas Costs- Decline from Base Case with \$1 to \$4 dollar range.

CRP Table 1 shows the dollar decline required from the base case natural gas avoided cost assumptions before a measure will fail a test using a negative NPV as the criteria for that particular test.[Error! Not a valid link.](#)Note: The NPV was negative in the base case filing.

The Clothes Washers are the first measures to fail the sensitivity tests to a decline in natural gas costs. The total program NPV benefit/cost ratio is still positive at a \$4.00 decline.

(2) Dth Savings – Reduction from base levels with 10% to 50% range.

CRP Table 2 – indicates the required percentage decline from the assumed achievable base case Dth savings before a measure will fail a test by producing a negative NPV result for that particular test.**Error! Not a valid link.** Note: The NPV was negative in the base case filing.

The savings in Dth is the most sensitive factor to all measures, not only in the Commercial Rebate Program but in all the programs. Again the Clothes Washers fail first but the total program still has a positive benefit/cost ratio even with a 50% decline in Dth savings.

(3) Discount Rate – Increase from base rate with 8% to 12% range.

CRP Table 3 – indicates the sensitivity to a change in the assumed 7% discount rate used in the base case.**Error! Not a valid link.** Note: The NPV was negative in the base case filing.

As noted in the other programs, the discount rate is the least sensitive factor that affects the measures in the program.

Observation: The Division feels that the measures offered under the Commercial Rebate Program provide an array of offerings which give the commercial GS customers an opportunity to realize reduced gas costs in their energy bills and supports the measures presented in this DSM Pilot Program for the commercial GS customer class.

RESIDENTIAL HOME AUDIT AND WEATHERIZATION

This program offers eleven measures and comprises two primary components which are (1) home energy audits and (2) weatherization measures. The home energy audits can either be an on-site audit conducted by QGC technicians or a mail in audit in which the participant answers questions and receives advice back from QGC. A \$25 fee will be charged for the on-site audits but will be refunded back to the participant if a measure is undertaken.

The weatherization measures are customer initiated and the program will be administered by Nexant with rebates mailed back to the participants. Some of the measures will need to be installed by pre-qualified contractors in order to receive the rebate.

The first year budget is \$922 thousand of which \$180 thousand is based on participation levels and \$742 thousand for first year program costs.

Sensitivities:

(1) Gas Costs- Decline from Base Case with \$1 to \$4 dollar range.

RAW Table 1 shows the dollar decline required from the base case natural gas avoided cost assumptions before a measure will fail a test using a negative NPV as the criteria for that particular test.**Error! Not a valid link.**

Only three measures under the RIM test were sensitive to reduced prices in natural gas, with wall insulation being the first measure to produce a negative NPV with a \$2.50/Dth decline in the base prices used in this filing. Because of the program costs, a \$1.00 decline in gas price causes the program to fail the RIM test and a \$1.50 decline in gas price causes the program to fail both the TRC and UCT test.

(2) Dth Savings – Reduction from base levels with 10% to 50% range.

RAW Table 2 – indicates the required percentage decline from the assumed achievable base case Dth savings before a measure will fail a test by producing a negative NPV result for that particular test.**Error! Not a valid link.**

Four of the eleven measures were sensitive to changes in Dth savings. Wall insulation was the first measures to fail any of the four tests. It has the lowest benefit cost ratio in all four tests in the base case filing. A 10% decline in Dth savings will fail the program as a whole on the TRC and RIM tests while a 15% decline in savings fails the program for the UCT test.

(3) Discount Rate – Increase from base rate with 8% to 12% range.

RAW Table 3 – indicates the sensitivity to a change in the assumed 7% discount rate used in the base case.**Error! Not a valid link.**

The individual measures again are not that sensitive to changes in the discount rate however due to the program costs a 9% discount rate fails the program for the TRC and UCT test while an 8% discount fails the program for the RIM test.

Observation: The Home Audit and Weatherization programs provide customers an opportunity to select from an array of measures which offer the lowest customer participation costs and yet provide an opportunity for those customers to achieve some significant savings. The low flow shower head provides the greatest benefit cost ratio under the TCR test than any of the other measures offered under any of the programs.

PARTICIPATION COMMENTS

These programs all have “variable” cost associated with them due to the level of customer participation. The level of participation is most sensitive to the Home Audit and Weatherization Program due to the level of staffing required for qualified QGC technicians. A 15% decline in participation from base levels will cause the program UCT test to produce a negative NPV. A 20% decline will cause the program’s TCR test’s NPV to go negative. Because of this fact, it is important that GS customers become aware of these programs and participate in them.

The Division feels that these programs are important in raising the awareness of QGC's GS customers to the importance of conserving energy, not only from a dollar savings impact it may have on their bills but as measures which may dampen total demand that can then have a positive effect on reducing the price of natural gas in the market place. One cost consideration of this application is the category under Market Transformation Costs. First year costs are budgeted at \$911 thousand dollars. Over the three year period, the costs are projected at \$2.4 million. Once again, these costs are a necessary part of this application in order to effectively raise the awareness of customers to the importance of conservation. The Division is cognizant of the fact that this is an area where close scrutiny of these expenditures measured against the impact of program awareness will be of great importance.

LOW INCOME WEATHERIZATION

Part of the stipulation reached in this Docket contained the provision for QGC to increase the funding by \$250,000 a year for the state's Low Income Weatherization Program. The Division feels this is an important contribution to this worth while program. It helps those individuals who may not be able to participate in other programs become more energy efficient through appliance upgrades as well improve the safety and health of those individuals in the program by providing a means for them to receive a through inspection and correction of possible safety hazards which may exist in their homes.

SUMMARY

The Division supports this expedited application for the implementation of DSM programs and recommends to the PSC approval of the application as filed without a formal hearing if there are no objections from any parties to implementation of these DSM Programs on a three year pilot basis.

The Division wishes to commend QGC and its consultants for the work product that has produced these DSM programs. The Division recognizes that a couple of the measures are border-line with some of the tests but feels the data assumptions are conservative

enough to warrant their inclusion in the various program offerings.

The Division also understands that in order to really understand the effectiveness of these measures, proper measurement of the results that each measure may contribute is of critical importance. In order to understand that effect, proper measurement techniques need to be implemented and understood.

To that end, the Division will continue to participate in the DSM Advisory Group and also will develop with QGC the best ways to measure the effectiveness of these DSM programs realizing that there are external factors such as weather and economic factors that also influence customer's gas usage patterns.

This application is based on a three year pilot program and the full effect of these programs may not be known until that time, but during the interim period the Division will monitor these programs and may make recommendations to the PSC which may alter the course of some if not all the programs mentioned within this application.

Cc: Questar Gas Company
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