BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket Nos. UE-121697 and UG-121705
Puget Sound Energy, Inc. and NW Energy Coalition
Joint Petition for Approval of a Decoupling Mechanism

Docket Nos. UE-130137 and Docket No. UG-130138
Puget Sound Energy, Inc. Expedited Rate Filing

ICNU DATA REQUEST NO. 028

ICNU DATA REQUEST NO. 028:

Referencing MJV-18T at 3-6, has the Brattle Group performed any studies to determine whether there is evidence that decoupling increases energy efficiency? If yes, please provide these studies.

Response:

No. The Brattle Group has not studied this specific relationship. The Brattle Group knows that decoupling has a long history of being associated with policies that encourage energy efficiency and lower kWh and therm sales growth. Please see Puget Sound Energy, Inc.'s Response to ICNU Data Request No. 029.

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket Nos. UE-121697 and UG-121705
Puget Sound Energy, Inc. and NW Energy Coalition
Joint Petition for Approval of a Decoupling Mechanism

Docket Nos. UE-130137 and Docket No. UG-130138
Puget Sound Energy, Inc. Expedited Rate Filing

ICNU DATA REQUEST NO. 029

ICNU DATA REQUEST NO. 029:

Referencing MJV-18T at 3-6, is Mr. Vilbert aware of any studies not performed by the Brattle Group that provide evidence that decoupling increases energy efficiency? If yes, please provide these studies.

Response:

Dr. Vilbert is not aware of any published, multi-state, empirical studies on the relationship between decoupling and the size and effectiveness of energy efficiency programs. It is Dr. Vilbert's understanding that the Washington Utilities and Transportation Commission has ordered evaluations of decoupling mechanisms implemented by Washington utilities. One such evaluation is H. Gil Peach & Associates, *Independent Examination of Cascade Natural Gas Corporation's Washington Decoupling Mechanism* (May 23, 2011), a copy of which is attached at Attachment A to Puget Sound Energy, Inc.'s Response to ICNU Data Request No. 029.

Although Dr. Vilbert has not analyzed this independent examination, it does conclude that this decoupling pilot program resulted in expanded energy conservation efforts, while protecting customers from undue cost risk (p. xi, conclusion (10)).

Please note that Attachment A to Puget Sound Energy, Inc.'s Response to ICNU Data Request No. 029 is provided in electronic format only.

ATTACHMENT A to PSE's Response to ICNU Data Request No. 029

July 11, 2011

Mr. Dave Danner
Secretary and Executive Director
Washington Utilities & Transportation Commission
1300 S. Evergreen Park Drive SW
Olympia, WA 98504-9022

RE: Independent Examination of Washington Pilot Decoupling Mechanism

Dear Mr. Danner:

In compliance with **Docket UG-060256,** Orders 5-7, Cascade Natural Gas Corporation hereby submits the attached final report related to the Independent Third Party Evaluation of Cascade Natural Gas Corporation's Washington Decoupling Mechanism Pilot.

If you have any questions concerning this submittal, please contact Allison Spector at 360-788-2356 or Dennis Haider at 701-222-7639.

Sincerely,

Allison Spector

Allison A. Spector

Independent Examination of Cascade Natural Gas Corporation's Washington Decoupling Mechanism

May 23, 2011

H. Gil Peach & Associates LLC/Scan America®
16232 NW Oakhills Drive
Beaverton, OR 97006

Scan America® Vision Statement
To be a world leader in developing truthful measurement and useful results; to support development of efficient, ethical, and effective practices, sustained economically, to advance human development.

Scan America® Goals Statement
Excellence in the integration of knowledge, method, and practice
Improvement and learning at all levels
Contextually sound measurement, analysis, and reporting
Anticipate and meet the needs of our clients
Awareness of human relevance and of the ethical core of research
To go further, to find better ways

Scan America® Mission Statement
With extensive experience in North America, Europe, and Asia, together we can provide the full range of management, planning, and evaluation services – wherever and whenever there is a need.

Scan America® Website www.scanamerica.net

H. GIL PEACH & ASSOCIATES LLC H. Gil Peach, Ph.D.
16232 NW Oak Hills Drive hgilpeach@scanamerica.net
Beaverton, Oregon 97006-5242, USA
Telephone: (503) 645-0716 EIN: 93-1323715
Fax: (800) 204-3803 DUNS: 60-279-2954

SCANADA CONSULTANTS LTD. C. Eric Bonnyman, M.Sc.
1446 Birchwood Drive scanada@sypatico.net
Mississauga, Ontario L5J 1T2, Canada
Telephone: (905) 403-9835

ÅF-ENERGI & MILJÖ AB Agneta Persson, M.Sc.
Division Head, Energy & Environment agneta.persson@enel.af.se
Box 8133
SE-104 20 Stockholm, Sweden
Telephone: +46-8 657 13 89

Suggested Citation:

Peach, H. Gil, Howard Reichmuth and team. Independent Examination of Cascade Natural Gas Corporation's Washington Decoupling Mechanism. Beaverton, Oregon: H. Gil Peach & Associates, May 2011, Monograph 52011-1.

Independent Examination of Cascade Natural Gas Corporation's Washington Decoupling Mechanism

Table of Contents

Figures

Tables

Executive Summary

"The purpose of a pilot program is to better inform the Commission, the Company and stakeholders about the effectiveness of decoupling and related mechanisms."[1] . This study examines several aspects of the Cascade Natural Gas Washington Decoupling Pilot. These include the basic decoupling mechanism, associated conservation efforts and achievements, corporate integration of philosophy and efforts, rate designs, financial impact, customer impact, impact for low-income customers, regulatory impact, and social impact and benefits.

The basic conclusions reached through a fairly exhaustive study of different aspects of the three-year pilot are:

(1) **A decoupling mechanism is an agreement.** Cascade's Washington decoupling mechanism is essentially an agreement or *quid pro quo*: In return for decoupling that reduces volumetric sales revenue risk to the Company by providing the opportunity to recover lost margins in the form of a weather-normalized revenue per customer (RPC) true-up to a base-year, the Company would market, promote and provide customers with information, energy conservation programs administered through expert delivery agents, and incentives to conserve natural gas.

(2) **The decoupling mechanism provided strong customer protections and was implemented consistent with the pilot design.** The customer protections included in Cascade's Washington decoupling mechanism were demonstrated to be effective throughout the pilot (for example, a strict earnings cap).

(3) **Sales are increasing due to increasing numbers of customers.** The increasing gross revenue from natural gas sales during the pilot was driven almost exclusively by an increasing number of customers for the residential sector (Rate 503). Average natural gas use per home essentially stable but the number of residential customers has been increasing over the pilot For the commercial sector (Rate 504) there were increasing numbers of customers accounting for most of the increase in therm sales and also a small increase in average natural gas use per customer. The earnings cap was not exceeded in 2008 but was exceeded in 2009 and 2010. The Company appears quite healthy in a traditional business sense. It is within this tendency of increased gross sales that the decoupling mechanism and the conservation effort operated during the pilot.

(4) **Cascade provided conservation.** Cascade Washington provided customers with information on energy conservation and with meaningful energy conservation programs administered through expert delivery agents, including incentives to conserve natural gas, throughout the pilot.

[1] UG-060256, Order 06, Order Approving Conservation and Low Income Weatherization Plan, Subject to Conditions; Authorizing and Requiring Compliance Filing; Denying Public Counsel's Motion for Leave to File Comments, August 16, 2007, P. 11, §35.

(5) **Conservation performance was good.** During the pilot, Cascade Washington exceeded its conservation targets the first two years but ran behind (at 78% of target) in the third year. However, special conditions existed in the third year. Completion of a major custom project expected to save 119,962 therms was delayed until 2011 due to a shortage of essential parts and will be credited to the year completed (2011). Completion during 2010 would have put Calendar Year 2010 energy savings at better than 99% of target for 2010.

(6) **There was no downside demonstrated for customers.** During the pilot, the rules associated with any award of revenue to the company under the decoupling mechanism showed no meaningful downside for any customer class or for low-income customers.

(7) **There was full recovery of conservation costs by Cascade.** Cascade Washington was able to recover costs of its energy conservation operations through a separate mechanism.

(8) **There was no recovery of margins by Cascade.** As it turned out, Cascade Washington did not recover any revenues under the award/penalty provision of the mechanism in any of the three pilot years. This outcome was the result of the consumer protections built into the decoupling mechanism, which was implemented consistent with the design of the pilot.

In the first year (2008) the rules provided for a small refund to customers since at year end the value in the deferred balance (cumulative variance) account was negative. In the second year (2009) the rules provided for a write-off due to the earnings cap. In the third year, the award/penalty mechanism would have provided 80% recovery due to performance at seventy-eight percent (78%) of the conservation target for Calendar Year 2010. However, the earnings cap was exceeded leading to a write off of the amount in the deferred balance account. The loss of the 80% award in comparison with the amount of revenue received by exceeding the decoupling mechanism earnings cap created a small net loss of approximately $333,968.20 due to the operation of the earnings cap.

(9) **The bill effects during the pilot were small.** Cascade's Washington decoupling mechanism demonstrated very small bill effects during the pilot. Such rate changes are so small as to be almost imperceptible to customers.

(10) **The decoupling mechanism works.** On balance the operation of the pilot shows an overall social benefit (i.e., from expanded energy conservation efforts) while protecting customers from undue cost risk. Overall, the mechanism appears to work as planned.

(11) **The decoupling mechanism is not optimal for the company.** At the same time, the decoupling mechanism may not be optimal for the Company in that it did not provide an award to the Company for performance though the Company demonstrated good conservation performance. A more optimal mechanism would provide some recovery for conservation performance and proportionately so for better performance. To put this observation in proper context, however, the decoupling mechanism did work as planned: it provided practical and valuable assurance that there would not have been a revenue shortfall if sales had declined for conservation and

other non-weather related reasons. It happened that this assurance was not required to provide recovery of lost margins during the pilot since gross therm sales increased over the pilot. This increase was due primarily to increases in the numbers of residential and commercial customers. There was also a small tendency for natural gas use per customer to increase in the commercial sector (but not in the residential sector, for which natural gas per home remained stable).

The Cascade Washington decoupling mechanism falls towards the strict side of decoupling mechanisms due to the incorporation of the Conservation Performance target award/penalty mechanism and the Earnings Cap which prevents windfall profits. We recommend one small change to the conservation award/penalty part of the mechanism: to increase the award for meeting or surpassing the yearly target from 90% to 100% of the year-end variance amount.[2] Other similar changes could also be considered (please see Recommendations).

Overall, a number of findings and recommendations were developed:

Conclusions

This section summarizes findings from throughout the text of the study. There are fifteen formal findings:

1. Cascades' Washington decoupling mechanism functions as planned (in line with the theory and logic model of decoupling programs). Since the decoupling mechanism worked for the pilot, such decoupling should be regarded as a proven effective approach. See P. 12.

2. The mathematics of Cascades' Washington decoupling mechanism was correctly carried out. See P. 17.

3. Direct pilot bill impacts on included classes (Rates 503 & 504) are so small that they are essentially negligible. See P. 20.

[2] This recommendation is for a treatment that does not follow the modified Avista model where recovery has been reduced by the Commission to 45% to compensate for decreases in energy use due to energy conservation (Docket UG-060518, Order 10, Page 118, §299). The Avista model, as modified, now appears to be a "limited" decoupling mechanism approach more like a Lost Revenue Adjustment Mechanism (LRAM). It appears to be a 'one-way' adjustment mechanism, that allows partial recovery of revenue shortfalls from reduced sales (*i.e.*, just that portion that can be tied to utility conservation programs and efforts). If so, the Avista mechanism would suffer from most of the usual inadequacies of the LRAM alternative (*i.e.*, it's unidirectional, not symmetrical; it doesn't do anything to mitigate the company's assumed or imputed desire to increase sales; it may have a negative effect on mobilizing utility resources to work on building codes and product innovations or other types of energy conservation for which it does not get credit; and it is not likely to be a strong influence on corporate culture). There is no evidence that the Commission intended an Avista-type mechanism for Cascade; however, the Commission clearly indicated in its generic decoupling docket (U-100522) that it was open to proposals for either limited or full decoupling. Our recommendation here is to move to 100% for meeting or surpassing the yearly target and retaining full decoupling for the two rate classes in the pilot.

4. The direct pilot bill impacts on excluded classes (Rates other than 503 & 504) are nonexistent. However, there is some direct and indirect benefit to all customers from Cascade's provision of energy conservation information and DSM programs and incentives. See P. 21.

5. The pilot had a positive impact on realigning the utility focus from increasing sales to improving customer service through provision of energy conservation information, energy conservation programs and customer incentives to conserve energy. See P. 22.

6. During the three-year pilot, the Company did not recover revenue margin in any of the three years. See P. 22.

7. The decoupling pilot has fulfilled its design, following from the Settlement Agreement. See P. 24.

8. There are disincentives in the current structure of the decoupling mechanism: lack of symmetry in the conservation performance award/penalty mechanism, disincentive on the cost side, and the unreliability of award from the award/penalty mechanism for excellent performance. See P. 26.

9. There is no justification for reducing the Company's authorized return on equity based on the operation of its decoupling mechanism. However, we condition this finding on a resetting of the base year for the decoupling mechanism after every two years. See P. 26.

10. Though the decoupling mechanism works as planned and the mathematics of calculations have been correctly performed, the pattern of negative results and swings in monthly variance and in cumulative deferred amount suggest that a better award/penalty mechanism might be found. One preferable characteristic of an award/penalty mechanism is a consistently positive value when performance is positive and a trend of increasing value over time when conservation performance is increasingly positive. See P. 29.

11. A tighter specification for showerheads should be used to obtain more conservation savings. See P. 49.

12. The pilot did not include an independent third-party evaluation of energy savings results. See P. 58.

13. There was no financial return to Cascade as a result of the pilot. However, the decoupling mechanism did provide a valuable kind of hedge. See P. 60.

14. The fact that Cascade launched and sustained substantial conservation communications, programs and incentives demonstrates the integrity of Cascade's commitment to their side of the business arrangements set forth in the Settlement Agreement, and demonstrates a substantial good faith effort on the part of Cascade. See P. 60.

15. Cascade has progressively improved its understanding and relationship with the Community Action Agencies that deliver low-income weatherization within its service territory. However, natural gas energy efficiency programs are disadvantaged relative to electric low-income programs in that the CAAs have to incur risks of timing and often unknown availability of funds from other sources in order to fully weatherize a gas heated home. The disparity with electric low-income weatherization (which generally does not present this complex problem) puts gas customers at a disadvantage and may result in natural gas program low-income funds being much harder for the agencies to use. See P. 94.

Recommendations

On balance, we would recommend continuing a decoupling mechanism for Cascade Washington, with the modifications suggested below.

There are ten specific recommendations:

1. There is a reasonable and legitimate rationale in improving balance or fairness and in improving the effectiveness of Cascade's Washington decoupling mechanism if the annual year-end award/penalty for conservation performance is improved at the top end of the performance scale by moving the maximum award from 90% to 100% of the year-end variance amount. See P. 23.

2. The base year for the decoupling mechanism should be reset after every two years. See P. 26.

3. There is a need to consider the operation of the current earnings cap on the cost side, specifically as it may not provide the right signal (and award) for cost control. See P. 26

4. The current structure of the conservation performance award/penalty mechanism along with the operation of the earnings cap has not resulted in Cascade receiving a reliable award calibrated to DSM performance during the pilot. Accordingly, a small incentive per therm conserved might be considered as an extension of the decoupling mechanism to provide a reliable award calibrated to good work in energy conservation. See P. 27.

5. The annualized value of energy savings from the cumulative conservation installations has the preferred characteristics of being always a positive number and having a trend of increasing value over time. A portion of this value or a model based on this value might be considered in place of the current mechanism for the award/penalty structure for each year-end in which the cumulative deferred amount (Table 15) is negative. See P. 29.

6. Upgrade the showerhead specification to 2 gallons per minute or less at 80 pounds per square inch. See P. 49.

7. In any future energy conservation effort, provision for periodic independent evaluation of energy savings claimed by the Company and/or the delivery agent should be included in the project design. This evaluation should include an on-site inspection component. See P. 58.

8. An increase in the fixed portion of the bill as an alternative to decoupling is not recommended because it correspondingly diminishes the per-unit "price signal" that customers see regarding their natural gas consumption, and thereby reduces the incentive for pursuing energy conservation. Moreover, shifting costs to the fixed portion of the bill relatively penalizes those who conserve and use little energy, and relatively rewards those who are wasteful. The recommendation is for the current decoupling mechanism to be retained, but to raise the potential award from the conservation governor mechanism to 100%. We further recommend that for years in which the earnings cap would otherwise require a write-off, there should be some performance incentive award linearly related to level of progress in meeting target. Further that energy use of new customers should be removed from the earnings cap assessment. Should it be determined not to restart decoupling, a pure LRAM could be considered, but is overall an inferior approach. Since the decoupling mechanism worked for the pilot, such decoupling should be regarded as a proven effective approach. See Page 74.

9. Cascade should explore the possibilities of modifications to the cost test for low-income programs. Consider requesting commission approval to use the ARRA weatherization cost test (undiscounted BTU/dollar) as the preferred test for low-income programs (in place of the Total Resource Cost test. As a second (lower ranked) alternative see if the Commission will consider a modification of the current Total Resource Cost test to substitute a social discount rate (Wisconsin uses 2%) for the current utility effective discount rate in order to make program funding per measure fully cover measure cost. There are many ways to keep but tweak the Total Resource Cost test for the low-income sector. A reasonable goal is to provide funding to the CAAs for the full cost of either gas weatherization jobs as a first goal, or of each individual measure of a set as a lower ranked goal (such as replacement gas furnaces and replacement gas water heaters). See P. 96.

10. Explore adoption of the Washington Self Sufficiency Standard as the indicator of eligibility for the low-income program. See P. 98.

The report is organized in the following structure:

- Mechanism Structure and Design
- Associated Conservation Efforts and Achievements
- Corporate Integration of Philosophy and Efforts
- Rate Designs and the Effects of Weather

- Financial Impact
- Customer Impact
- Low-Income Impact
- Regulatory Impact
- Societal Impact and Benefit
- Conclusions and Recommendations.

Introduction

This report presents the results of the H. Gil Peach & Associates LLC/Scan America® (HGPA) examination of Cascade Natural Gas Corporation's (Cascade's, CNGC's, or the Company's) natural gas decoupling mechanism in Washington. Fundamentally, decoupling moves the source of profit for a utility away from volumetric sales of natural gas towards technical management, cost-control, and customer service. The fiduciary responsibility under decoupling is met by conservation performance rather than sales. In particular, properly designed decoupling allows the utility to provide energy conservation information, programs, and incentives for customer conservation without fear that these efforts will threaten the ability of the utility to recover its authorized fixed costs due to reduced sales volume. In essence, it is a trade or *quid pro quo* agreement. The Company receives a more firm assurance of stability of revenue recovery with the understanding that it will be more supportive of customer energy efficiency.

After excluding pass through costs from consideration and after adjusting for weather, Cascade's Washington mechanism results in the keeping of a monthly variance account which tracks the difference between weather normalized actual revenue each month during a pilot year and the revenue per customer authorized in the corresponding month of the base year (2006) times the current number of customers. This difference is computed monthly. At the end of each calendar year of the pilot (2008, 2009 and 2010) between 70% and 90% of the year-end amount in the tracking account *may be* awarded to the Company based on energy conservation performance and subject to an earnings cap approved in the last rate case. Or, under certain conditions the amount in the variance account may be refunded to customers or be written off.

One of the purposes in implementing a mechanism that decouples profit from volumetric sales is to remove a barrier to the Company for helping customers achieve energy conservation. Questions addressed in this examination are diverse but tend to fall into three primary groups:

(1) Questions about the *revenue mechanism*

(2) Questions regarding energy conservation, and

(3) Other related questions.

The key factor linking these areas is Cascade's organizational commitment.

Since about 1990, evaluations have usually included a logic diagram, a simple model of the essence of the program under examination showing how the change in primary activities associated with a program would be expected to lead to immediate, middle-range and long-term effects, if the program works as intended. A simple logic model for Cascade's Washington partial decoupling pilot is shown in Figure 1.

- Under the volumetric sales revenue model, we would expect higher short term sales and a Company drive for higher revenue per customer leading to a higher return on equity.

- Under the decoupling revenue model, we would expect short-term emphasis on customer service including provision of energy conservation information, programs and incentives to customers leading to stable revenue per customer and stable return on equity, rather than an emphasis on increasing energy sales.[3]
- Numbers of customers would be expected to increase under either model.[4]
- Either model would provide strong price signals to customers regarding the value to the customer of energy conservation. Though the price signal would be slightly stronger under the volumetric model, actual energy conservation accomplished would likely be much higher under the decoupling model (with its provision of energy conservation information and marketing and promotion of DSM programs and incentives).
- The long-term effects of the decoupling model, though they cannot be directly measured during a short-term pilot, are likely to be long-term energy conservation of natural gas supplies, more restraint on commodity cost of natural gas, reductions in greenhouse gas emissions, and enhancement of the range of both company and customer options.

This, in brief, is the theory of the program.

[3] Under the rules of a for-profit business system, a utility has a fiduciary responsibility to its stockholders to maximize return. The trade-off inherent in decoupling is intended to cause the legal duty and the impulse to profit to find other expressions than in increasing energy use per customer. Decoupling is intended, in part, to sever the possibility of increased profit resulting from increased sales. The Company receives a more firm assurance of stability of revenue recovery with the understanding that it will be more supportive of customer energy efficiency. At the same time, given the problems of the current economy, increasing global resource concerns throughout all of the energy sectors, and the implications of global warming, we may hope for an intelligent and mature organizational culture within utilities that looks towards securing long-term community sustainability for customers, thereby enhancing corporate sustainability from a long-term perspective. Utilities are also an essential component of our national economic infrastructure, which must be efficient, effective, and well maintained to support community needs, especially as we enter the next 100 years of difficulty due to global warming. The energy sector will become increasingly critical for the duration. CNGC is working to reduce unnecessary greenhouse gas emissions though its emphasis on energy conservation under decoupling. In more mature organizations we may expect a redefinition of the "most profitable" possibilities away from short term profit maximization (especially as the Commission engages in practical experiments such as decoupling pilots to find optimal rules for encouraging mature institutional behavior on the part of utilities) to moderate and long-term perspectives concerned for sustainability of return under uncertain and challenging economic conditions.

[4] Though for a long established utility with a defined service territory in a period of national economic problems, new customers may be expected to be relatively few and essentially insignificant in number.

REVENUE DECOUPLING LOGIC MODEL				
A. Volumetric Model - Prior to Decoupling				
Primary Activity		Participants		Outcomes
Sales	→	Customers	→	Short Term (1-5 Years)
				Higher short term sales -> Higher Revenue per Customer -> Higher Return on Equity
				Stronger price signals to customers but less DSM energy conservation
				Effort to increase customer use of product (increase customer energy intensity)
				Increase number of customers
			→	Medium Term (5-15 Years)
				Strong sales culture in utility (more sales through higher competitiveness brings rewards)
				Enhanced effort to increase customer use of product (increase customer energy intensity)
				Higher overall natural gas bills to customers
			→	Long Term (15-100 Years)
				More sales means more gas purchases, quicker use of available gas reserves, forcing higher supply prices
				Narrows range of company and customer options
				Higher overall natural gas bills to customers
				Increased greenhouse gas emissions
B. Revenue Decoupling Model				
Primary Activity		Participants		Outcomes
Service	→	Customers	→	Short Term (1-5 Years)
				Emphasis on customer service -->Stable Revenue per customer-->Stable Return on Equity
				Strong conservation price signals to customers and fielding of diverse energy conservation programs to help customers be educated on energy conservation and incentives to assist with improvements (more DSM accomplished)
				Increase number of customers; No drive to increase energy intensity of customers
			→	Medium Term (5-15 Years)
				Strong service and technical, maintenance, training and safety culture in utility (prudent management and customer service brings rewards)
				Focus on careful management, maintenance and upkeep, customer service, employee safety, civic engagement
				Enhanced long-term stability of earnings and return on equity
				Lower overall natural gas bills for customers
			→	Long Term (15-100 Years)
				Lower sales means lower gas purchases, conserving gas reserves and restraining
				Enhances range of company and customer options
				Lower overall natural gas bills for customers
				Reduction in greenhouse gas emissions

Figure 1: Simple Logic Model for Examination of Revenue Decoupling.

The Decoupling Mechanism: Structure & Design

The Washington decoupling mechanism was established by Order 05 (Settlement Agreement) of the Washington Utilities and Transportation Commission (WUTC) dated October 10, 2006 in Docket UG-

060256 and currently operates as refined in Order 06 (Final Order) dated April 16, 2007 in Docket UG-060256 and Order 07 (Order Accepting Addendum to Conservation Plan; Approving Tariff Filing) dated October 1, 2007 in Docket UG-060256. The core of the mechanism is the calculation of a delta between "expected" revenue and actual weather normalized revenue.

Decoupling is a regulatory ratemaking tool intended to break the link between a utility's recovery of costs and customer energy consumption, bringing stability to cost recovery. Decoupling is designed to alleviate the utility's concern that customer energy conservation might jeopardize the utility's ability to adequately recover its authorized costs. That provides a context in which the utility may support customer energy savings efforts without the disincentive of loss of revenue recovery.[5] Cascade's Washington decoupling pilot mechanism applies as a form of full decoupling[6] to rate schedules 503 (Residential Service Rate) and 504 (General Commercial Service Rate). It does not apply to other rate schedules.

Three Parts

Cascade's Washington decoupling mechanism is straightforward but it does require some effort at computation. There are three parts to the mechanism: the revenue mechanism, the energy conservation performance calculations and rules, and an overall rule that limits recovery according to the earnings the cap established in the most recent rate case (Figure 2). The three parts operate together to determine cost recovery.

The Revenue Mechanism

The pilot operates for a three-year period (2008, 2009 and 2010). In the pilot, Cascade defers revenue lost to lower than expected energy sales due to conservation and other non-weather related reasons. This amount is computed monthly. It is tracked in a deferral account and results in either a regulatory asset or liability associated with the actual consumption occurring during the month. Only the *revenue margin*[7] portion of the variable (consumption related) part of customer bills is affected by decoupling.

[5] Volumetric rates increase income to the utility if more gas flows through the pipes and decrease utility income if less gas flows through the pipes. Decoupling income from volumetric flow is designed to break this relationship.

[6] In one sense, the decoupling mechanism is partial decoupling in that award for meeting or exceeding yearly conservation targets is 90% rather than 100% and the decoupling applies to only two rates. However, within the Commission's definitions, the Cascade pilot qualifies as full decoupling for Rates 503 and 504 rather than as limited decoupling (Docket U-100522, Report and Policy Statement on Regulatory Mechanisms, Including Decoupling, to Encourage Utilities to Meet or Exceed their Conservation Targets, P. 8, §12; also see P. 8, footnote 25).

[7] Margin revenue is the revenue necessary for a utility to recover its cost of service net of purchased gas expenses and other expenses treated as "flow through" items in rates (*e.g.*, revenue taxes and conservation program riders). The margin revenue is divided by the number of customers to put the margin revenue on a revenue per customer (RPC) basis for the mechanism.

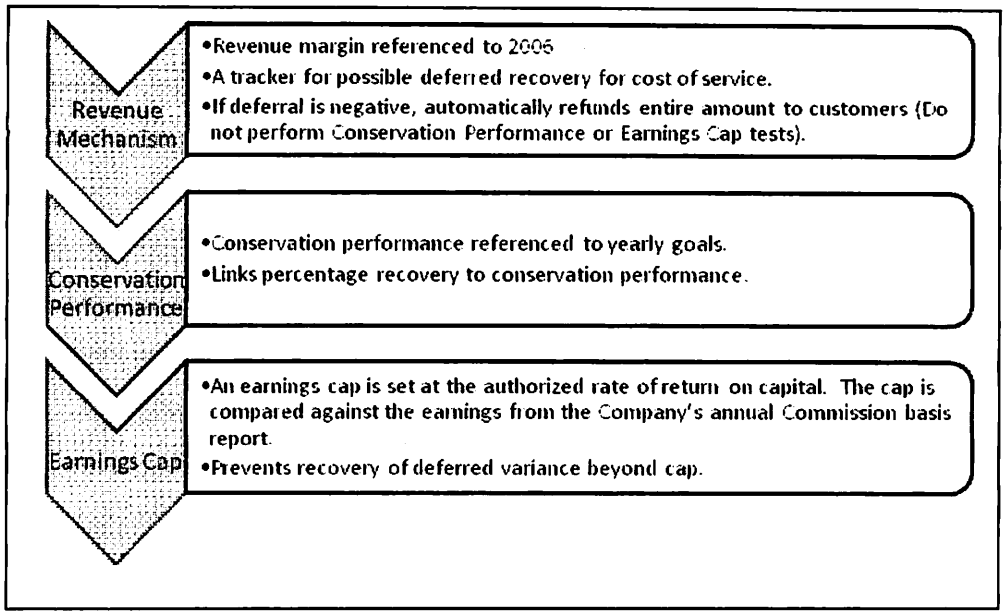


Figure 2: Three-Part Structure of the Revenue Mechanism.

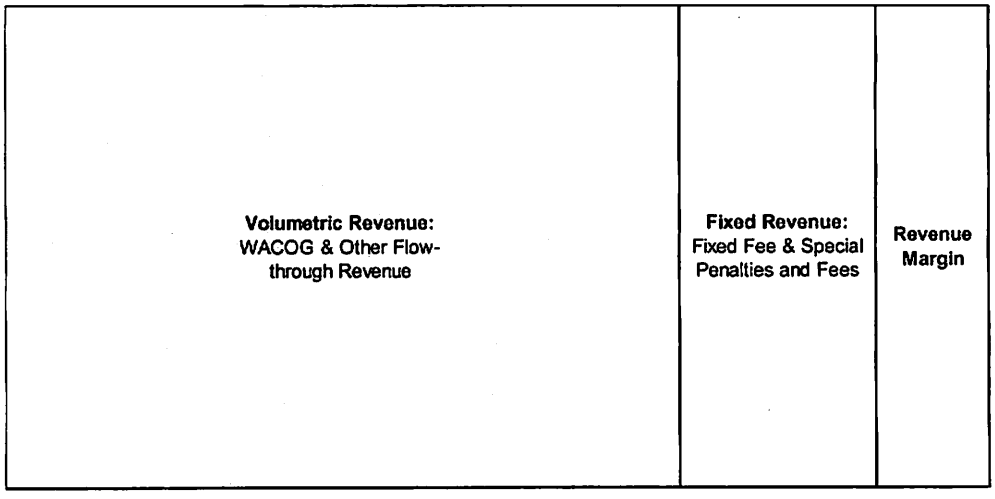


Figure 3: Portion of Cost Recovery affected by Decoupling Mechanism.

From a cost of service perspective, the variable part of the monthly bill for a customer is composed of the weighted average cost of gas to Cascade (a simple "flow through" cost to the customer, representing what Cascade has to pay for gas, referred to as "WACOG," and other expenses treated as "flow through") plus Cascade's revenue margin.

- Only the revenue margin is affected by decoupling.

- The WACOG along with other variable cost "flow through" expenses, the fixed monthly fee, and all other special penalties and fees (reconnection, disconnect charge, late payment charge, returned check charge, residential excess flow valves, new premise charge, meter tampering charge, and pilot light service charge) are not affected by decoupling (Figure 2).

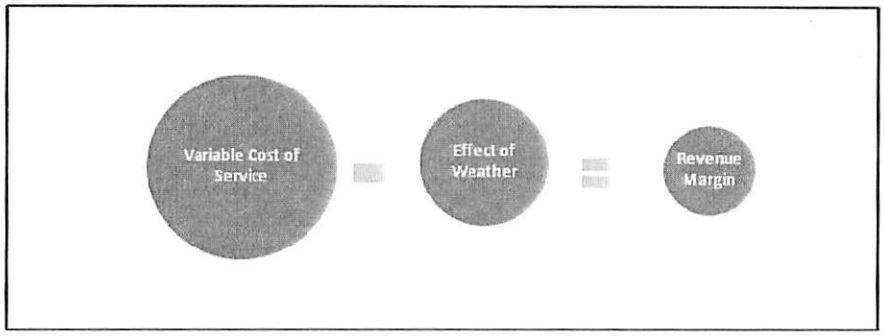


Figure 4: The effect of weather on variable cost of service is first removed.

To calculate the variance to be assigned to the tracker account each month, the effect of weather is first removed (Figure 4).

With the effect of weather removed, the Company then calculates the difference between the weather-normalized (actual) revenue margin experienced each month and the expected (baseline) revenue margin projected based on 2006 assumptions each month for each rate schedule. These monthly variance amounts are assigned to the deferred tracking account. The calculation is normalized to the current number of customers and is a four step procedure:

- For each of the twelve months in a year, the *baseline year* revenue margin dollar amount (the theoretical cost recovery net of WACOG, etc.) is calculated as the per customer baseline average commodity margin. For the pilot, the baseline year has been defined as Calendar 2006 (a year before the beginning of the pilot).[8] The per customer baseline average commodity margin is then multiplied by the current customer count.

[8] Using 2006 likely creates a very slight tendency to favor the utility in two respects. First, it is not likely that an established natural gas utility of long standing will incur any large increases in fixed costs. Existing assets will be undergoing depreciation. These factors will tend to reduce the revenue margin needed over time. Second, there is some yearly increase in number of customers which will (perhaps negligibly) somewhat reduce the average customer margin needed to meet the stable or declining fixed cost burden. Unusual economic conditions (such as loss of customers due to inability to pay) could reverse this tendency. In either case, while three years with the same per-customer baseline average commodity margin is fine for a pilot, for a more permanent design we

- The pilot (actual) amount each month is the weather normalized actual revenue margin experienced.
- The difference between these two numbers for any month (actual weather normalized minus baseline) is the variance for the month. Variances both below and above the expected value are included in the mechanism.[9]
- These monthly variance amounts are collected in the tracking account for each calendar year of the pilot. At the end of the year, the sum of the variance amounts for the calendar year resides in the tracking account. The yearly total is considered for possible deferred recovery.

Each March during the pilot, Cascade files a report for the previous calendar year with the Washington Utilities & Transportation Commission.[10] This report includes the annual variance result for the calculation outlined above along with revenue margin worksheets which show the individual monthly variances. As previously noted, the individual monthly variances may be positive or negative. The revenue margin cost recovery worksheets are designated as Appendix B to the report. With the revenue margin identified for the calendar year for possible deferred recovery, a separate determination is carried out on the Energy Conservation side.

The Energy Conservation Performance Mechanism

On the conservation side, an Energy Conservation Plan was established with the yearly targets shown in Table 1. The actual conservation, using deemed values for prescriptive measures and calculated estimates for custom measures, results in the program accomplished therm savings for each calendar year.

A conservation award/penalty mechanism is then applied as shown in Table 2. The most severe penalty occurs if the total annual savings (therms) is less than seventy percent of the conservation target for the year. In that case, deferred recovery is limited to seventy percent of the revenue margin for that calendar year as registered in the tracker account. If the total annual therm savings is at or above one-hundred percent of the conservation target for the year, the deferred recovery award is set at ninety

recommend that the per customer baseline average commodity margin be re-established fairly regularly, perhaps after every two years. This is discussed later in the report.

[9] The tendency of the monthly variance amount to swing back and forth from positive to negative is due in part to the monthly level of the weather adjustment. As defined, the variance is the revenue lost/gained due to lower/higher than expected energy sales due to conservation and other non-weather-related reasons. The striking character of the variation is shown later in the study (see Table 15, P. 28).

[10] There were no monthly reporting requirements associated with the Company's Decoupling Pilot. The Annual Decoupling Report for each of the years of the Pilot was filed with the Commission each March as well as an Annual Commission Basis Report, per the terms of UG 070256. Mechanism tracking and adjustments were provided as part of the Company's annual PGA filing. Source: Response to Data Request No. 8-2.

percent of the revenue margin difference for that calendar year.[11] Thus, in years in which deferred recovery is awarded, it ranges from seventy percent to ninety percent of costs found to be reasonable in the last general rate case (Table 2).[12]

Conservation Targets[13]			
Calendar Year	**Target Residential & Commercial/Industrial (Therms)**	**Target Low-Income Weatherization Program (Therms)**	**Target Total Annual Savings (Therms)**
2008	322,500	13,125	335,625
2009	415,000	26,250	441,250
2010	530,000	35,500	565,500

Table 1: Targets for Annual Savings (Therms).

Conservation Award/Penalty[14]	
Percentage of Annual Conservation Target Achieved	**Percentage of Deferred Annual Cost of Service Variance Awarded**
Less than 70%	70%
>70% and <80%	80%
>80% and <90%	90%
>90%	90%

Table 2: Penalty and Award for Conservation Performance.

[11] The setting for the lower end of this scale (70%) is reasonable. The technical recovery of fixed cost as determined by the Commission as reasonable in the last general rate case would be 100% (UG-060256, Order 06, P. 11, §33). Cascade is, therefore, not at risk for seventy-percent if usage per customer declines. The setting for the top end of the scale (90%) for maximum recovery under optimal performance means that the Washington decoupling mechanism is fairly strict. (UG-060256, Order 06, P. 11, §33). Note that "reasonable" in this context does not mean the Company is "entitled" to this recovery. The Commission provides the Company an opportunity to earn this return.

[12] Again, in this context "reasonable" indicates only that the Commission provides the Company an opportunity to earn this return.

[13] Calculated as midpoints to values in original Plan table, Docket UG-060256, Order 6, Order Approving Conservation and Low income Weatherization Plan, Subject to Conditions; Authorizing and Requiring Compliance Filing; Denying Public Counsel's Motion for Leave to File Comments, August 16, 2007, Pp 8-9, §§27-30.

[14] Docket UG-060256, Order 6, Order Approving Conservation and Low income Weatherization Plan, Subject to Conditions; Authorizing and Requiring Compliance Filing; Denying Public Counsel's Motion for Leave to File Comments, August 16, 2007, P 10, §32.

In the Revenue Mechanism part of the calculation, the revenue margin variance amount was established. In the Conservation Performance part, the recoverable percentage of the deferred variance amount is established (Table 2). It remains only to apply the earnings cap.

The Earnings Cap

The authorized rate of return on capital established in the previous rate case (here 8.85%) operates as the earnings cap. If the earnings cap is not encountered, the percentage of the variance amount determined by the conservation performance calculation is recovered. If the earnings cap is encountered, recovery may be less, or even zero. Recovery is lowered to the point at which the Company's rate of return set in the previous rate case (8.85%) is not exceeded. If Cascade's rate of return on capital for the year is already above 8.85% prior to consideration of the variance amount, then recovery of the deferred cost of service variance is eliminated altogether for that pilot year (Docket UG-060256, Order 06, August 16, 2007, Pp. 12-13, §§38-40).[15] This requirement increases the amount of Commission staff effort in reviewing the Commission basis report.

Conservation Overview

This section presents an overview of energy conservation results of the pilot.

Overview of Conservation Results for Calendar Year 2008

For 2008, Cascade achieved therm savings of 454,480 therms, or slightly over 135% of its performance target of 335,625 therms for that year. This achieved savings breaks out by program as shown in Table 3:[16] Therms saved (454,480) exceed the target for 2008 (335,625 therms) so recovery for 2008 would be set at 90% of the variance amount (plus interest) for 2008 by the conservation performance mechanism.

[15] The addition of the earnings cap requirement, beyond the conservation performance criterion, means that the Washington decoupling mechanism is an example of a very strict decoupling mechanism having very strong customer protections. The objective of the earnings cap is to effectively prevent a "windfall profits" situation. It does so in this regard by placing a firm bound on increased rate of return, in order to help ensure that the decoupling mechanism does not facilitate excessive earnings by the utility. One unintended result of this earnings cap is that it could, in effect, penalize the utility for taking other actions (not relating to sales levels, *e.g.*, cutting costs) if that provides them with a higher realized rate of return. If they do that (in effect, running their company more efficiently) they could lose the ability to recover the revenue shortfall from reduced sales, if their resulting earnings level exceeds the earnings cap. Essentially, this is a 'one-directional' limit that puts extra constraints on the company to the benefit of ratepayers. (It should be noted that the existence of this earning cap can be seen as helping to obviate the need for reducing the utility authorized rate of return, which is sometimes advocated as a concession in exchange for decoupling.)

[16] Source: Updated 2008 results from Table B: 2008 Achievements, P. 2 in Cascade Natural Gas Decoupling Mechanism Report for CY09, March 31, 2010. Note that these numbers are slightly adjusted from the original report for CY08, dated March 31, 2009.

However, for year-end 2008, the balance in the variance account is not a positive number so there is no award to the Company. Since the balance is a negative $479,310.02 (including interest),[17] this amount was 100% refunded to customers.[18] The Conservation Performance and Earnings Cap tests were not applied.

Table 3: Conservation Performance for 2008.

2008 Pilot Energy Savings				
Sector	Actual (Therms)	Percentage of Actual Total	Target (Therms)	Percentage of Target
Commercial & Industrial	191,837	42.2%	322,500	136.6%
Residential Program	146,676	32.3%		
Energy Savers Kits	101,982	22.4%		
Low-Income Weatherization Assistance Program	13,985	3.1%	13,125	106.6%
Total	454,480	100.0%	335,625	135.4%

Overview of Conservation Results for Calendar Year 2009

For 2009, Cascade achieved therm savings of 564,170 therms, or about 128% of its performance target of 441,250 therms for the year (Table 4).[19]

Table 4: Conservation Performance for 2009.

2009 Pilot Energy Savings				
Sector	Actual (Therms)	Percentage of Actual Total	Target (Therms)	Percentage of Target
Commercial & Industrial	275,604	48.9%	415,000	132%
Residential Program	226,491	40.1%		
Energy Savers Kits	47,342	8.4%		
Low-Income Weatherization Assistance Program	14,733	2.6%	26,250	56%
Total	564,170	100.0%	441,250	128%

[17] Cascade Natural Gas Corporation, Deferred Technical Adjustment Summary, 3/20/2009, final column, final row (deferred balance for Dec-08).

[18] "For CY2008, the entire negative balance amount in the Deferred Balance Account was refunded to customers." CNGC response to HGPA DR 4.3.

[19] Source: Table C: Final 2009 Achievements, P. 4 in Cascade Natural Corporation Annual Decoupling Mechanism Report Calendar Year 2010 for CY09, March 31, 2011.

As shown in this table, the actual savings exceeds the target for 2009. Considering only conservation performance recovery would be set for ninety percent (90%) of the total of the yearly variance amounts (including interest) for 2009. However, for 2009, the earnings cap was exceeded. For this reason, there was no recovery of the variance amount for 2009. The total variance amount of $97,335 with interest at year-end was written off.[20] The write-off amount was exceeded by increased earnings between the earnings cap for the decoupling mechanism (8.85%) and the actual earnings (9.16%). The difference in dollars earned between the decoupling mechanism earnings cap and actual earnings was $682,500.[21]

Overview of Conservation Results for Calendar Year 2010

For 2010, Cascade achieved therm savings of 444,581 therms, or about 79% of its performance target of 565,500 therms for the year (Table 5).

2010 Pilot Energy Savings				
Sector	Actual (Therms)	Percentage of Actual Total	Target (Therms)	Percentage of Target
Commercial & Industrial	224,357	50.5%	530,000	78%
Residential Program	187,871	42.3%		
Energy Savers Kits	1,544	0.3%		
Low-Income Weatherization Assistance Program	30,809	6.9%	35,500	87%
Total	444,581	100.0%	565,500	79%

Table 5: Conservation Performance for 2010.

For 2010, the cumulative deferred balance (including interest) was positive so there might have been an award to the Company. With performance at seventy-nine percent (79%),[22] the award would have been 80% recovery of the deferred balance. However, the Company's Commission Basis Earnings for the Calendar Year Ending December 31, 2010 was 9.06% against the revenue cap rule which is set from the previous rate case at 8.85%. Due to the earning caps the Company was not entitled to an award so none of the 2010 year-end deferred balance was recovered by the Company. The CAP deferral amount was $982,459 including interest. Eighty percent of this amount is $785,967.20. Actual earnings at 9.06%

[20] The Company's adjusted earnings must be less than the authorized 8.85% overall rate of return set in the Company's last rate case (UG-060256) to collect the 90% of variance amount (the variance amount was $97,335, including interest) indicated by the Company's conservation performance. However, the Company's Commission Basis Earnings for Calendar 2009 was 9.16% so the Company was not eligible to recover the deferred balance. Since the Company's earnings were above the threshold, the amount was written off. See also Footnote 15.

[21] This information is based on Company response to Data Request No. 8-3.

[22] The Company claims only seventy-eight percent (78%) in its 2010 report. This is probably due to a difference in rounding.

were approximately $452,000 over what earnings would have been at the decoupling mechanism earnings cap. So, for 2010, the earning cap cost Cascade $785,967.20 in lost margins and the additional earnings did not make up for a net loss of $333,968.20.

Finding 1: As demonstrated in this subsection of the study, Cascades' Washington decoupling mechanism functions as planned (in line with the theory and logic model of decoupling programs). Since the decoupling mechanism worked for the pilot, such decoupling should be regarded as a proven effective approach.

The Mathematical Calculation

The step by step mathematics for calculation of the variance amount by month is shown for a single month (January 2009) for General Commercial Service Rate Schedule 504 to demonstrate the calculation.[23] There are six steps (Figure 5):

Steps in Calculation of Month Values of Delta

1. Calculate the Weather Adjustment for each Region.
2. Add Regional Adjustments to Yield the Washington Weather Adjustment.
3. Apply Weather Adjustment to Pilot Months.
4. Calculate the Weather Normalized Commodity Margin for Each Month of the Pilot Year.
5. Construct the Base Year Weather Normalized Commodity Margin
6. Combine to obtain the delta.

Figure 5: Calculation of Monthly Conservation Difference for January 2009 for General Commercial Service Schedule 504.

Each of these steps listed in Figure 5 is developed, below:

[23] Data Sources: For each region, number of customers by region is based on monthly reports from Cascade's Customer Information System. For 2008, 2009 and the first six months of 2010, the information came from the RS464 Bill Frequency by District report. Since then, these numbers come from report CA1499. Actual Degree Days by region come from NOAA. Normal Degree Days by region came from the calculated normals using the testimony of Mr. Stoltz on weather normalization in docket UG-060256 and were based on Dr. Mote's testimony in the same docket. The coefficients (therms/DD) are from Mr. Stoltz's supporting work papers for the weather normalization adjustment in the same rate case. For total Washington, Actual Therms were derived from total billed therms plus monthly accounting accrual for unbilled plus the reversal for the prior months' unbilled accrual. The accrual for Unbilled therms is an accounting entry that is designed to estimate he amount of usage that has not been billed due to the use of Cycle billing. The adjustment is developed and is reversed the following month. The total Washington Actual Commodity Margin is a calculation that applies the tariffed margin rate by Actual Therms. Margin rates were established in the UG060256 rate case and are posted on the 503/504 tariff schedules. This information is from Company's response to Data Request No. 8-4.

(1) **Calculate the Weather Adjustment for each Region.** While computed separately by month for the full pilot year, only January 2009 is shown in the sequence of tables, as an example. First, the month's normal number of degree days is subtracted from the actual degree days for the corresponding 2009 month (D1, D2, D3, and D4). For each region, this degree day difference is multiplied by the monthly number of customers and the regional weather sensitivity coefficient (responsiveness in therms/degree day) to produce the weather normalization adjustment (F1, F2, F3, F4).

(2) **Add Regional Adjustments to Yield the Washington Weather Adjustment.** Second, (Table 7) the weather adjustments for the four regions are added together produce the total weatherization adjustment (H). Also, the number of customers for Cascade in Washington is computed (G). From this point forward, all calculations are for Cascades total Washington service territory. As in the other steps, the calculation is for January 2009. This calculation is repeated for each month in the 2009 pilot year. The quantity computed for the weather adjustment differs for each month.

(3) **Apply Weather Adjustment to Pilot Months.** For each month in the pilot year, the weather normalization adjustment for the month (H) is combined with actual therms sold (I). This gives the weather normalized therms associated with each month in the pilot year (J). Again, the result shown (Table 8) is for January 2009. The quantity of weather normalized therms is different for each month.

Table 6: Calculate Weather Adjustment to Sales by Region.

PILOT YEAR 2009				
Rate Schedule 504			January 2009	Source
REGION 1	BELLINGHAM			
	A1	Number of Customers	9,139	External
	B1	Actual Degree Days	878	External
	C1	Normal Degree Days	756	External
	D1	Difference	-121.7	(C1 - B1)
	E1	Coefficient (Therms/DD)	0.518738513	External
	F1	Weather Normalization Adjustment (Therms)	(576,949)	(A1 * D1 * E1)
REGION 2	BREMERTON			
	A2	Number of Customers	4,705	External
	B2	Actual Degree Days	738	External
	C2	Normal Degree Days	656.5	External
	D2	Difference	-81.5	(C2 - B2)
	E2	Coefficient (Therms/DD)	0.68631889	External
	F2	Weather Normalization Adjustment (Therms)	(263,174)	(A2 * D2 * E2)
REGION 3	WALLA WALLA			
	A3	Number of Customers	4,116	External
	B3	Actual Degree Days	918	External
	C3	Normal Degree Days	908.3	External
	D3	Difference	-9.7	(C3 - B3)
	E3	Coefficient (Therms/DD)	0.61513845	External
	F3	Weather Normalization Adjustment (Therms)	(24,560)	(A3 * D3 * E3)
REGION 4	YAKIMA			
	A4	Number of Customers	5,991	External
	B4	Actual Degree Days	1072	External
	C4	Normal Degree Days	1008.0	External
	D4	Difference	-64	(C2 - B2)
	E4	Coefficient (Therms/DD)	0.56443634	External
	F4	Weather Normalization Adjustment (Therms)	(216,418)	(A4 * D4 * E4)

Table 7: Results for Washington.

PILOT YEAR 2009				
Rate Schedule 504			January 2009	Source
TOTALS	TOTAL WASHINGTON			
	G	Total No. of Customers	23,951	(A1 + A2 + A3 +A4)
	H	Total Weather Normalization Adjustment (Therms)	(1,081,102)	(F1 + F2 + F3 + F4)

Table 8: Calculate Pilot Weather Normalized Therms

PILOT YEAR 2009				
Rate Schedule 504			January 2009	Source
TOTALS	TOTAL WASHINGTON			
	I	Actual Therms	14,931,430	External
	J	Weather Normalized Therms	13,850,328	(H + I)
	K	Ratio of Weather Normalized to Actual Therms	0.927595581	(I/J)

With the weather normalized therms value calculated for each month of the 2009 pilot year, the next step is express the result for each month in revenue dollars for the Washington service territory. This is the weather normalized commodity margin for each month.

(4) **Calculate the Weather Normalized Commodity Margin for Each Month of the Pilot Year.**

The ratio of weather normalized therms (J) to actual therms (1) is constructed (K). The actual commodity margin (L) is then multiplied by this ratio to produce the weather normalized commodity margin for each month (M)

Table 9: Calculate Weather Normalized Baseline Commodity Margin.

PILOT YEAR 2009				
Rate Schedule 504			January 2009	Source
TOTALS	TOTAL WASHINGTON			
	K	Ratio of Weather Normalized to Actual Therms	0.927595581	(I/J)
	L	Actual Commodity Margin	$3,460,956.16	External
	M	Weather Normalized Commodity Margin	$3,210,367.64	(K*L)

(5) **Construct the Baseline Weather Normalized Commodity Margin.** Multiply the (2006) baseline commodity margin/customer (N) for each month times the number of actual customers in the corresponding month of the pilot year (G).

Table 10: Expected Commodity Margin (2006 Assumptions; 2009 Customers)

ADJUSTED FROM 2006 Rate Schedule 504 TOTAL WASHINGTON				
			January 2006	Source
TOTALS	N	2006 Baseline Month Commodity Margin/Customer	$131.95	External
			January 2009	Source
	O	Corresponding 2009 Month Expected Commodity Margin using 2006 Baseline Adjusted for 2009 Month Customer Count	$3,160,334.45	(G * N)

(6) **Combine to obtain the delta.** The expected commodity margin is then subtracted from the actual commodity margin to produce the delta for each month. The delta shown in Table 11 is for January. This is the conservation difference for the General Commercial Service Rate Schedule 504 for January 2009.

Table 11 : Conservation Difference.

PILOT YEAR 2009				
Rate Schedule 504			January 2009	Source
	TOTAL WASHINGTON			
TOTALS	P	Conservation Difference (General Commercial Service Rate Schedule 504)	($50,033.19)	(M - O)

Each month, interest is applied to the amount in the variance account and the new variance amount is added to the cumulating total for the year. At year-end for each pilot year, the cumulative total is available. At this point, the conservation performance and earnings cap parts of the mechanism are applied. This results in an award to the Company, a refund to customers if the cumulative total for the year (including interest) is negative, or a write-off if the earnings cap is exceeded.
We have checked the mathematics in the Company's calculations in the pilot annual reports for 2008 and 2009 and find the calculations to be correct.[24]

Finding 2: The mathematics of Cascades' Washington decoupling mechanism was correctly carried out.

Effects on Included Classes

For 2008, the Conservation Performance target was exceeded but the deferral for the fifteen month period beginning October 1, 2007 and ending December 31, 2008 was negative (a negative balance of

[24] There are occasional differences of one unit due to differences in rounding or number of figures used beyond the decimal, but check final numbers are essentially identical with those in the reports. As an example, the report figure for January 2009 for the General Commercial Service Rate Schedule 504 corresponding to Table 10 is $50,033.28, a difference of nine cents or, essentially, no difference in result.

$479,310.02, including interest[25]). Since the balance was negative, this amount was 100% refunded to customers on the two included rates. With 166,330 customers in rate 503 and 23,816 in rate 504 in December 2008, the total number of customers in the included classes was 190,146. For a residential customer with approximately average energy use (660-710 therms), the refund was approximately $1.14 to $1.22 for the year. For a commercial customer with approximately average usage, the refund was about $5.68 for the year. These are approximate calculations.[26] However, the approximations are sufficient to demonstrate that the yearly refund for 2008 was quite small and effectively negligible within the context of customer bills for a year of service. Spread across the 278,090,239 therms billed for Calendar 2008 (161,954,765 residential plus 116,135,474 commercial), $479,310.02 is a refund of $0.001724 dollars per therm.

Table 12: Bill Effect Sizes of 2008 Decoupling Adjustment Refund.

Therms per Year & Year's Refund From 2008 Decoupling Adjustment							
Therms	300	660	710	1200	1800	3295	3550
Actual Refund	$0.52	$1.14	$1.22	$2.07	$3.10	$5.68	$6.12

For 2009, conservation performance again exceeded goals so the conservation performance mechanism indicated a ninety percent (90%) recovery of the year-end amount in the deferral account, including interest. The amount in the deferral account (including interest) was a positive $97,335.06, so there might well have been an award to the Company.[27] However, the Company's Commission Basis Earnings for the Calendar Year ending December 31, 2009 was 9.16%, exceeding the authorized overall rate of return of 8.85% in the most recent rate case (UG-060256) so Cascade was not eligible to recover for 2008.

With 167,866 customers in rate 503 and 23,932 customers in rate 504 as of December 31, 2009 the total number of customer in the included classes was 191,798. With a deferred balance of $97,335 and with 90% of the deferred balance equal to $87,601.50, if Cascade had been awarded that amount it would

[25] Cascade Natural Gas Corporation, Deferred Technical Adjustment Summary, 3/20/2009, final column, final row (deferred balance for Dec-08). Ninety percent of this amount is $431,379.02 which is the dollar amount that would have been recovered by the Company if it had been a positive rather than a negative balance.

[26] The calculation also disregards the effect on new customers and on customers present only for parts of years. However, both effects can be disregarded because there are so few customers in this category. Even for a high-use low-income customer for whom a five dollar bill has a much higher relative value than for a regular residential customer, a refund of two to three dollars for a year is not of reasonable importance.

[27] Cascade Natural Gas Annual Decoupling Mechanism Report for Calendar Year 2009 (Docket UG-060256), Deferred Technical Adjustment Summary, "Deferred Balance" column, for December 09.

only have resulted in a charge to customers of about $0.46 per customer for the year. The actual assessment would be related to number of therms rather than the number of customers, but this calculation is sufficient to illustrate the relative lack of importance of the charge on a yearly energy bill. Spread across the 207,715,789 therms billed for Calendar 2009 (118,053,848 residential plus 89,661,941 commercial), $87,601.50 would have been an assessment of $0.000422 dollars per therm.

Table 13: Bill Effect Sizes of 2009 Decoupling Adjustment if it had been Awarded.

Therms per Year & Year's Assessment From 2009 Decoupling Adjustment If Earnings Cap Had Not Been Exceeded							
Therms	300	660	710	1200	1800	3295	3550
Theoretical Assessment	$0.13	$0.28	$0.30	$0.51	$0.76	$1.39	$1.50

In any case, if there had been an assessment from customers it would have been ninety percent of delivery costs actually approved in the previous rate case, only applied with a time lag. So long as general rate cases or resetting of the base year for the decoupling mechanism occurs frequently (for example, after every two years) an assessment from a decoupling adjustment is not likely to be noticeable.

For 2010, the cumulative deferral (including interest) was a positive number ($982,459).[28] Based on the conservation performance award/penalty mechanism, eighty percent (80%) of this amount ($785,967.20) might have been recovered by the Company for the twelve month period ending December 21, 2010. However, as in 2009, the earnings cap came into play. The Company's Commission Basis Earnings for the Calendar Year ending December 31, 2010 was 9.06%, exceeding the authorized overall rate of return of 8.85% in the most recent rate case (UG-060256) so the Company was not entitled to recover. The net loss created by the difference between the small excess earnings amount and the amount that would have been recovered had the earnings cap not come into play was $333,968.20.

[28] Cascade Natural Gas Corporation Annual Decoupling Mechanism Report Calendar Year 2010, March 31, 2011. See the final line in the final row of the final table, "Cascade Natural Gas Corporation, Conservation Alliance Plan Using Cascade HDD Coefficients with No Annual CAP Update, Deferred Accounting Details – Twelve Months Ended December 31, 2010."

Therms per Year & Year's Assessment From 2010 Decoupling Adjustment If Earnings Cap Had Not Been Exceeded							
Therms	300	660	710	1200	1800	3295	3550
Theoretical Assessment	$1.76	$3.88	$4.18	$7.06	$10.59	$19.38	$20.88

Table 14: Bill Effect Sizes of 2010 Decoupling Adjustment if it had been Awarded.

At the same time, the included classes received the security and assurance that comes from knowing their natural gas company would help them with energy conservation information plus make available opportunities to participate in meaningful energy conservation programs including the availability of incentives. For the long-term, building strong energy conservation capability also provides service for all in lowering greenhouse gas emissions.[29]

Finding 3: Direct pilot bill impacts on included classes (Rates 503 & 504) are so small that they are essentially negligible.

Effect on Excluded Classes

Decoupling had no negative effect on excluded classes since they are not included in the decoupling mechanism and its effect on rates. At the same time, some members of excluded classes received some energy conservation assistance and energy conservation costs are spread across all therms.[30] There is also a benefit of partnering with a natural gas company that maintains in-house energy conservation expertise and provides energy conservation services and incentives through expert delivery agents. There are the secondary economic benefits of energy conservation producing downward pressure on natural gas market prices, and the broad economic benefits to the state economy of reducing expenditures on imported natural gas[31]. Lastly, there are environmental benefits shared by all created

[29] Conservation Costs (incentives paid plus programmatic costs) are reported in a separate section of this study.

[30] All classes are included, except transportation customers, which are also ineligible for the DSM programs.

[31] Washington has to import 100% of the natural gas consumed in the state. When energy conservation reduces the amount of natural gas used by Washington customers, the energy import 'dollar drain' is reduced, increasing the amount of dollars available for spending inside Washington.

by a natural gas company that markets, promotes, and implements energy conservation projects that support reductions in greenhouse gas emissions.

Finding 4: The pilot bill effect sizes on excluded classes (Rates other than 503 & 504) are nonexistent. However, there is some direct and indirect benefit to all customers from Cascade's provision of energy conservation information and DSM programs and incentives.

Removal of Disincentives vs. Providing Positive Incentives

As shown in the Logic Diagram for Cascade's Washington decoupling program (Figure 1, Page 3, above), the theory of the program is that decoupling volumetric sales as the force driving revenue is expected to remove an important disincentive to the Company to encourage conservation and efficiency measures (through information, provision of energy conservation programs and provision of incentives) to reduce overall energy use. According to the program theory this should save energy, help customers lower their monthly bills and benefit the environment by reducing greenhouse gas emissions.

However, if, as in the case for the pilot, the regulatory structure a utility faces is limited only to (1) recovery of energy conservation related expenses and (2) an assurance of a *chance* (subject to the rules of the mechanism) to recover revenue margin (on a revenue per customer basis) as determined in the last rate case when sales are reduced, then it could be that a Company might simply be indifferent to conservation. Is the pilot mechanism enough to incent excellence in energy conservation?

In the longer-term, the offset to revenue risk provided by decoupling addresses only a portion of the economic concerns that impact utility decision-making regarding the provision of energy efficiency services for customers. The simple removal of a disincentive might or might not have much effect on utility organizational culture. Removal of a disincentive might or might not carry weight against the potential for gaining revenue from diligent and continuous sales campaigns in the purely volumetric cost of service model. Utilities are large and complex organizations with many different internal organizational interests and always carry a fiduciary responsibility. A weak offset in the form of direct cost recovery plus a decoupling mechanism that only provides a yearly award on an occasional basis may or may not have much effect on a utility. If there is an effect on internal culture, it may or may not prove reliable from year to year.

The dualistic nature of the challenge utilities face regarding energy conservation programs for their customers (*i.e.*, the loss of sales revenues when customers conserve and the inability to realize any profit from administering energy conservation programs) has been the subject of much discussion in the industry. The issue was well-framed by the authors of the National Action Plan for Energy Efficiency (NAPEE) report entitled *Aligning Utility Incentives with Investment in Energy Efficiency* (US EPA, 2007):

> The two impacts described above [program cost recovery and recovery of lost margins through mechanisms such as decoupling] pertain to potential direct ***disincentives*** for utilities to engage in energy efficiency program investment. The third impact concerns ***incentives*** for utilities to undertake such investment. Under traditional regulation, investor-owned utilities earn returns on capital invested in generation, transmission and distribution. Unless given the opportunity to profit from energy efficiency...there is a clear financial incentive to prefer investment in supply-side assets, since these investments contribute to enhanced shareholder value. Providing financial incentives to a utility if it performs well in delivering energy efficiency can change that business model by making efficiency profitable rather than merely a break-even activity. (P. E-3) [emphasis added]

In the current case, Cascade's Washington decoupling program, together with cost recovery for actual conservation program operations, has succeeded in the purpose of helping the company agree to provide meaningful conservation information, conservation programs and customer incentives. It is, essentially, a trade or *quid pro quo* agreement that has been made to facilitate the provision of energy conservation programs for its customers.

In looking to the future, it is possible that the overall regulatory approach might benefit from being adjusted to add some type of a positive incentive to encourage and reward optimal energy conservation program results. Given that the current decoupling mechanism is very effective in protecting customer interests (with the 90% of approved margin for meeting or surpassing a yearly conservation goal and the earnings cap) there may be room to incorporate a modest shareholder incentive of some type to provide a positive incentive for attaining excellent energy savings results.

Finding 5: The pilot had a positive impact on realigning the utility focus from increasing sales to improving customer service through provision of energy conservation information, energy conservation programs and customer incentives to conserve energy.

Finding 6: During the three-year pilot, the Company did not recover revenue margin in any of the three years.

From an objective standpoint, it should be noted that the mechanism does not entirely remove the utility disincentive regarding the loss of volumetric sales from energy conservation. Even with excellent program performance and earnings below authorized, the utility can recover only 90% of the shortfall in sales. For balance, it would be desirable for the decoupling mechanism to be further refined to increase the protections for the Company, given that in its current form it is effective in protection of customer interests (with the 90% of approved margin for meeting or surpassing energy conservation goals and the

earnings cap). The performance of the decoupling pilot as documented in this study and these considerations lead to the following recommendation (Recommendation 1).

Recommendation 1: There is a reasonable and legitimate rationale in improving balance or fairness and in improving the effectiveness of Cascade's Washington decoupling mechanism if the annual year-end award/penalty for conservation performance is improved at the top end of the performance scale by moving the maximum award from 90% to 100% of the year-end variance amount.

Fulfillment of Intentions

From a regulatory perspective, the basic objectives of the decoupling pilot in terms of desired outcomes are illustrated in the Logic Model for the decoupling pilot program (Figure 1, Page 3).[32] For convenience, the bottom section of the Logic Model is reprinted on Page 24 (Figure 6). In this examination of the decoupling pilot, the study team was able to observe most of the short-range outcomes intended for the pilot.

One noteworthy observation is that the pilot appears to have been successful in producing a corporate environment that is very supportive of customer energy conservation. Having been in many utilities over many years, it is easy to recognize a utility in a "sell, sell, sell" mode by the posters in the hallways, the constant emphasis on sales over service, and a hard driving sales culture that has little tolerance for helping customers save energy. None of that is observable at Cascade Natural Gas. There was no evidence of any drive to increase customer energy intensity, while, in contrast there was active provision of energy conservation information, there were active energy conservation programs provided through expert delivery agents, and meaningful customer incentives to conserve energy were offered to customers.

At the same time, the financial costs to customers of having the decoupling provisions in place have been negligible. The potential for extra revenue obligations inherent in the decoupling mechanism did not come into play for the pilot year ending in December 2008 because the mechanism resulted in a refund to the customers. Similarly at year-end 2009, the earning cap came into play and the amount otherwise receivable from the variance account at year-end was written off. And for year-end 2010 the earnings cap again came into play and the amount otherwise receivable from the cumulative deferred balance account was written off.

As discussed earlier, if the year-end award had come into play, the dollar amount per customer for each pilot year would have been very small. As observed in operation, the decoupling pilot mechanism demonstrated a strong "plus side" in terms of its intended goals with no "down side" in terms of

[32] The Logic Model shows the program as designed to work. For discussion of challenges to the decoupling design see the Challenges section of this study (P. 29).

possible bill effect sizes of any noticeable significance for regular residential, commercial, or low-income customers.

B. Revenue Decoupling Model				
Primary Activity		Participants		Outcomes
Service	→	Customers	→	**Short Term (1-5 Years)**
				Emphasis on customer service -->Stable Revenue per customer-->Stable Return on Equity
				Strong conservation price signals to customers and fielding of diverse energy conservation programs to help customers be educated on energy conservation and incentives to assist with improvements (more DSM accomplished)
				Increase number of customers; No drive to increase energy intensity of customers
			→	**Medium Term (5-15 Years)**
				Strong service and technical, maintenance, training and safety culture in utility (prudent management and customer service brings rewards)
				Focus on careful management, maintenance and upkeep, customer service, employee safety, civic engagement
				Enhanced long-term stability of earnings and return on equity
				Lower overall natural gas bills for customers
			→	**Long Term (15-100 Years)**
				Lower sales means lower gas purchases, conserving gas reserves and restraining
				Enhances range of company and customer options
				Lower overall natural gas bills for customers
				Reduction in greenhouse gas emissions

Figure 6: Bottom Section of Decoupling Program Logic Model.

Finding 7: The decoupling pilot has followed the Settlement Agreement and fulfilled its design

Creation of Disincentives

The purpose of having decoupling be symmetrical is to prevent the utility from recovering the revenue margin maintained in the variance account under certain conditions while, at the same time, the utility is protected from revenue erosion from sales per customer that fall below forecast (*i.e.*, as expected through the decoupling calculation based on revenue approved due to monthly sales in the base year and which are due to energy conservation and non-weather-related reasons). There are two issues of symmetry to be considered: the Conservation Performance test and the Earnings Cap.

As noted in Recommendation 1 (Page 23, above), we recommend improving regulatory symmetry by improving the maximum award in the award/penalty conservation performance calculation from 90% to

100% of the year-end variance amount. This will provide a fair and equitable symmetry to the decoupling mechanism.

The way the earnings cap works, of course, goes beyond this consideration of symmetry in the conservation performance mechanism and requires separate consideration. The earnings cap was introduced to "...provide an effective safeguard against potential over-earning, and allow the Commission to assess its usefulness during the pilot program" [Docket UG-060256, Order 5, Page 32, §100, Lines 3-5]. To these ends, we observe that:

- For CY 2009 the earnings cap came into play and converted what would otherwise have been a small year-end revenue recovery amount from the variance account (90% of $97,335.06 or $87,601.50) into a Company write-off.
- For CY 2010, the earnings cap again converted what would otherwise have been a year-end revenue recovery from the cumulative deferred balance account (70% of $958,868.97 or $671,208.28) into a Company write-off
- More broadly, though the write-offs were not large, the earnings cap did confirm its ability to remove the possibility of windfall profits.

However, there may be other ways to structure a similarly effective earnings cap that will also provide some limited incentive to the Company.

As one form of disincentive, if decoupling is in place, the primary remaining way to increase earnings is to reduce costs of operation. As long as this is done through real efficiency improvement, and not by diminishing customer service, this may generally be regarded as a good thing, as it should reduce total costs to ratepayers in future rate cases. Given the current structure of the earnings cap, as an unintended side-effect, reducing costs could produce no net increase in earnings because the revenue recovery would be reduced to the earnings cap set in the prior rate case (for the pilot, 8.85%). So, in such a case, the current structure of the earnings cap might create a disincentive to create higher earnings through this type of improvement. As Cascade Natural Gas appears to have been taking steps to contain cost of service this concern may need to be noted in the further development of specifications for the earnings cap. This may be considered a form of "cost risk" (though from cost reduction) and cost-risk is not addressed by the decoupling mechanism.

Another form of disincentive is the lack of reliability of award for good conservation work. As noted earlier, there may be room to add a modest shareholder incentive of some type to provide a positive incentive for attaining excellent energy savings results. A problem with the current conservation performance award/penalty mechanism is that it is supposed to serve (calibrated to performance) each year as an award for good work. Yet, as shown by the pilot, it cannot be counted on to provide an award, even if good conservation work is done. The advantage of adding a small incentive for actual conservation savings produced each year is that good effort would reliably produce a small award calibrated directly to achievement.

Finding 8: There are disincentives in the current structure of the decoupling mechanism: lack of symmetry in the conservation performance award/penalty mechanism, disincentive on the cost side, and the unreliability of award from the award/penalty mechanism for excellent performance.

One additional potential source of disincentive that was not present in this pilot, although it has been raised in the decoupling context in some venues is the notion of a downward adjustment to utility rate of return. One of the ideas about decoupling is that since it is intended, in part, to reduce risk to revenues traditionally associated with volumetric rates, then it might follow that with a slightly reduced risk the rate of return should be in some sense commensurately reduced. Such a change, however, would create a significant disincentive. In this case, the operation of the pilot has demonstrated that for each pilot year only small dollar amounts are being generated (either as refund to customer, write-off, or award to the Company). Since the conservation performance award/penalty mechanism awards dollars based on approved revenue per customer amounts from the prior rate case, there is no justification for reducing the Company's authorized return on equity based on the operation of its decoupling mechanism.[33] However, we condition this finding on either a rate case or a resetting of the base year after every two years.

Finding 9: There is no justification for reducing the Company's authorized return on equity based on the operation of its decoupling mechanism. However, we condition this finding on a resetting of the base year for the decoupling mechanism after every two years.

Recommendation 2: The base year for the decoupling mechanism should be reset after every two years.

Recommendation 3: There is a need to consider the operation of the current earnings cap on the cost side, specifically as it may not provide the right signal (and reward) for cost control.

[33] Moreover, as noted previously, the existence of an overall earnings cap tends to serve a similar function in protecting customers from excess earnings that a utility might realize in part from having a decoupling mechanism in place.

Recommendation 4: The current structure of the conservation performance award/penalty mechanism along with the operation of the earnings cap has not provided a reliable award calibrated to DSM performance during the pilot. Accordingly, a small incentive per therm conserved might be considered as an extension of the decoupling mechanism to provide a reliable award calibrated to good work in energy conservation.

Mathematical Summary & Calculation Methods

The margin revenue factors in the live spreadsheet (response to DR 3.7) along with the revenue mechanism yield the monthly deficiencies and excesses in the deferral accounts. Table 15 summarizes the monthly deferrals and cumulative deferred balance by month and for each year-end.[34]

- One interesting pattern in these numbers is that twenty-five of the thirty-six cumulative deferred amounts (about 69%) are negative. That is, they would represent a refund to customers if that month happened to be treated as a year-end. This is in contrast to the fact that in each month, energy conservation is occurring so that for each actual year-end the aggregate of conservation performed over the year is a positive number.

- A second interesting pattern in the monthly variance amounts is their tendency to swing hard in both positive and negative directions. There appears to be no consistent trend in either the size of the numbers or in whether they are positive or negative. However, in the short (nine month) 2010 pilot year all but one of the cumulative deferred values are positive, suggesting that the cumulative deferred distribution is becoming positive over time and perhaps with another two years to run it would have become consistently positive.

[34] The monthly deferral does not include interest, while the cumulative deferred balance includes interest.

Table 15: Monthly Deferral & Cumulative Deferred Balance.

DEFERRED ACCOUNTING DETAILS (MONTHLY & YEAR END)						
Quantity	Oct-07	Nov-07	Dec-07			
Variance	(542,098.37)	(515,633.65)	520,102.46			
Cumulative Deferred	(542,098.37)	(1,057,732.02)	(537,629.56)			
Quantity	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08
Variance	725,191.42	(1,689,293.90)	(475,944.83)	769,589.40	(292,975.20)	285,603.68
Cumulative Deferred	187,561.86	(1,501,732.04)	(1,977,676.87)	(1,208,087.47)	(1,501,062.67)	(1,215,458.99)
Quantity	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08
Variance	56,289.91	223,821.22	(50,898.68)	(87,818.61)	319,236.16	353,500.18
Cumulative Deferred	(1,159,169.08)	(935,347.86)	(986,246.54)	(1,074,065.16)	(754,829.00)	(401,328.82)
Quantity	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09
Variance	305,195.86	(1,086,449.85)	(545,118.37)	1,082,325.60	(118,362.11)	11,118.15
Cumulative Deferred	305,195.86	(781,253.99)	(1,326,372.36)	(244,046.76)	(362,408.86)	(351,290.71)
Quantity	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
Variance	(38,651.56)	2,999.50	(120,527.60)	15,655.79	62,464.85	541,386.33
Cumulative Deferred	(389,942.28)	(386,942.78)	(507,470.38)	(491,814.58)	(429,349.73)	112,036.60
Quantity	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10
Variance	779,562.85	(787,892.19)	127,153.55	724,297.40	(313,919.19)	426,501.60
Cumulative Deferred	779,562.85	(8,320.34)	118,824.20	843,121.61	529,202.42	955,704.02
Quantity	Jul-10	Aug-10	Sep-10			
Variance	277,924.43	(31,988.90)	(242,660.58)			
Cumulative Deferred	1,233,628.45	1,201,639.55	958,868.97			

The annual adjustment factors and true-up calculations are mathematically correct. These numbers represent conservation and other factors after the influence of weather is removed, and the swings in the numbers likely reflect the specific weather adjustment process. When the numbers are less than zero, usage and/or cumulative usage are less than in the corresponding month of the base year (2006). If in a year-end month, this would represent a refund to customers. Thus, the negative cumulative amount for December 2008 was refunded. Though the positive cumulative amount for December 2009 would have been awarded to the Company at 90% under the Conservation Performance mechanism, the Rate Cap had been exceeded that year so the amount was written off. For September 2010, the last entry within the pilot period, the cumulative amount was again a positive number. However the conservation performance mechanism reduced recovery to the default value of 70% so there was no award through the award/penalty part of the mechanism.

Though the full decoupling mechanism works as planned in all of its parts and although all calculations have been correctly performed, there is a question inherent in the number of negative cumulative deferred numbers in Table 15. This is the total that is in theory available as an award to the Company

for good energy conservation performance. But it would be more desirable in its role as a possible award if the cumulative deferred amount were consistently positive (even if small). For this reason, as an alternative, the annualized actual conservation savings might offer a more consistent award structure.[35]

Finding 10: Though the decoupling mechanism works as planned and the mathematics of calculations have been correctly performed, the pattern of negative results and swings in monthly variance and in cumulative deferred amount suggest that a better award/penalty mechanism might be found. One preferable characteristic of an award/penalty mechanism is a consistently positive value when performance is positive and a trend of increasing value over time when conservation performance is increasingly positive.

Recommendation 5: The annualized value of energy savings from the cumulative conservation installations has the preferred characteristics of being always a positive number and having a trend of increasing value over time. A portion of this value might be considered as a supplement to the current mechanism for the award/penalty structure for each year-end in which the cumulative deferred amount (Table 15) is negative.

There have been no changes to calculation methods for the decoupling mechanism over the pilot.[36]

Challenges

In Order 05 (Docket UG-060256), the Commission expresses a strong commitment to energy conservation as a goal. As noted earlier in this study, Cascade's Washington decoupling mechanism is essentially a trade or *quid pro quo* agreement. The Company receives a more firm assurance of stability of revenue recovery with the understanding that it will be more supportive of customer energy efficiency. To this point, this study has shown that the mechanism was correctly implemented and the

[35] Annualized energy savings represent the annualized value of therms saved by all measures installed during a particular year. This is not the amount actually saved during the year due to the time distribution pattern of the installations.

[36] There have been corrections to calculation results. As noted earlier, the 2008 annual results were updated in the 2009 report (Cascade Natural Gas Decoupling Mechanism Report for CY09, March 31, 2010). Also the 2009 annual results were updated in the 2010 report (Cascade Natural Gas Decoupling Mechanism Report for CY10, March 31, 2011).

mathematical calculations required for the mechanism were correctly performed. However, parties have raised a number of concerns about decoupling. These are addressed briefly here.

Transfer of Weather Risk. Concern is expressed that the decoupling mechanism to some extent shifts weather-related risks from shareholders to customers. Weather-adjustment mechanisms simply weather normalize therms sold. While included within a decoupling mechanism, they can also be operated separately outside a decoupling mechanism. In this pilot there was no transfer of weather risk because there was no recovery of the variance amount in any of the three pilot years.

Preference for Cost of Service Pricing. This position holds that that decoupling may introduce some distortion of price signals to customers. The position combines cost of service pricing with a perspective that markets solve all problems through the mechanism of supply and demand in a best approximation to a theoretical "free market." In its pure form, all fixed charges would be placed according to cost causation based on cost of service studies. Beyond the fixed charge (allocated across all customers within a customer class), the volumetric charge would be structured with the WACOG and flow through costs as at present (essentially as "pass through costs") plus a "reasonable" return commensurate with any additional costs and with business risks such that a utility would maximize profit through maximizing energy sales.

Facing pure or relatively pure cost of service prices, a customer might then respond independently by purchasing less natural gas or more natural gas depending on individual needs, desires and economic capability. Or, the independent intelligent customer with enough capital or credit access might invest in energy efficiency measures to lower the yearly cost of natural gas by reducing their energy needs. In this perspective, if price signals are moderated by other factors, then the customer has not been provided with the sharpest price signals possible and might decide to forego energy conservation. This model incorporates a fundamental assumption of conventional economics, that each customer as well as each utility is a rational independent entity acting to maximize self-interest. There is no sense of the collective dimension of social reality except to assert that the collective interest of both people and organizations is best served through the market mechanism.

Sharp (un-moderated) price signals would be expected to gradually induce individual customers to independently decide to make individual investments in energy efficiency. This perspective incorporates an assumption that all customers have the financial wealth and/or credit access to install energy conservation measures. In addition, the perspective assumes full awareness on the part of each customer so that the measures installed are the most efficient. Within this perspective the role of the utility is to exercise fiduciary responsibility by working to increase the energy intensity per customer, providing support for regional growth and economic development and (bottom line) promoting sales of therms. Conversely, the role of the customer is to respond to price signals. As price increases over time it is assumed that the customers as a whole will moderate purchase of therms by independently adopting energy efficient equipment and behaviors.

A decoupling mechanism interferes with this vision in two ways. First, it provides information, energy efficiency programs and customer financial incentives to conserve energy as well as quality control on installation methods, materials and equipment. Second, the direct link from volumetric sales to profit is severed. At the same time sales of energy is de-motivated by cutting this link, the marketing and promotion of energy conservation information, programs, and customer incentives to conserve are now connected to fiduciary responsibility.

In the context of global warming and sustainability concerns, promotion of energy conservation has an inherent ecological and collective dimension. In any case the vision of the utility as simply functioning best when it narrowly works to maximize profit through maximizing sales of therms is not a good fit for the physical world where our concerns include institutional sustainability so that utilities, as vital national defense infrastructure, will function well for the long-term by helping customers with energy conservation and efficiency while reducing greenhouse gas emissions. In any case, the Commission is trying to encourage utilities to effectively support energy conservation.

Price Signals to Customers. A second position that is concerned with price signals is that in a decoupling mechanism, opportunity to earn a return is set by a prior base-year rate case which sets revenue per customer (RPC). With a set RPC, and subject to certain rules such as the conservation performance part of the decoupling mechanism and the earnings cap, it is possible that the award/penalty part of the decoupling mechanism might award a return to the Company from the amount in the variance account at the end of the year. When this happens, the amount is recovered from customers.

In a decoupling mechanism (as opposed to a Lost Revenue Adjustment Mechanism or LRAM) the return recovered includes not only lost sales due to energy conservation administered through Company provided energy efficiency information to customers and Company sponsored energy conservation programs with direct incentives. It also includes the effects of energy conservation due primarily to other sources. These sources include federal energy efficiency campaigns, programs and direct and tax incentives; state campaigns, programs and direct and tax incentives; promotions by big box stores (dollars off on Energy Star appliances, and the like), communications efforts by conservation organizations, communications about global warming, communications about resource scarcity, cross-communications from the marketing and promotional efforts of other utilities' energy conservation programs, religious messages on avoiding the sin of gluttony and preserving the world, and the lag effects from all of these efforts from previous years. Beyond this, recovery includes "other effects" outside of conservation (except for weather, which is removed from the calculations through weather-normalization). These other effects may include changes in energy use due to changes in the general economy. That is, if sales were lower than forecasted (for whatever reason, including energy efficiency), there could be a recovery by the utility and so an increased cost to customers whether they participated in the Company's energy conservation programs, or not.

If customers experience rising costs through the recovery provisions of the decoupling mechanism this might prove a disincentive for further conservation ("I spent the money to weatherize my home, but then the utility increased prices, so I can't tell if I am saving any money through weatherization.").

However, based on the numbers generated by the application of the decoupling mechanism during the pilot, this effect should be trivial in the worst case and likely non-existent. This is because the rate adjustments are tiny and go in both directions over time making recovery under decoupling unlikely.

Fewer Rate Cases. A further concern, if decoupling tends to eliminate or reduce risk to return due to lower sales is that a utility might become disposed to see cost recovery as automatic. There might be an interest in filing fewer rate cases and some risk that the Company would over-earn. The way this might happen is that the revenue per customer (RPC) part of the decoupling mechanism established for the base-year might carry over for several years during a cycle of economic decline. Then, each year, the Company return might show an increase relative to (declining) sales. This seems a reasonable concern. However, in Order 06, the Commission added the earnings cap to the mechanism so over-earning will not occur (Docket UG-060256, Order 06, August 16, 2007, Pp. 12-13, §§38-40). In addition, we recommend that in order to keep the base-year fresh, the base-year be reset following every two years of operation of the decoupling mechanism.

Decoupling as a Weak Incentive. Yet another concern is what happens to corporate culture under decoupling, since (in itself) decoupling only serves to make a company indifferent to conservation.[37] In contrast, an alternative approach to motivating companies towards marketing and promotion of effective energy efficiency programs is provided by the Lost Revenue Adjustment Mechanism, LRAM. This is a "one-sided" mechanism (in favor of the utilities). Because it compensates utilities for revenue shortfall from an energy efficiency program, but allows utilities to keep any excess sales revenues if overall sales increase for whatever reasons, it might be thought a more complete incentive. Yet with LRAM, the utility does not receive an incentive for energy conservation that occurs outside of a utility's programs (for example improvement in codes). Decoupling severs the link from increased sales to increased returns. In contrast LRAM is a "both and" proposition. Here the utility is rewarded for increased sales and compensated for energy conservation accomplished. With decoupling alone, though the link from increased sales of energy to increasing profit is severed, the agreement to do effective energy conservation is simply an agreement. A utility might turn from such an agreement while keeping decoupling without loss and possibly with a gain. Yet, at the same time, the LRAM alternative by itself, though it directly rewards the utility for each unit of energy saved does not discourage an energy sales emphasis alongside the conservation emphasis.

Motivation and Alertness. For investor-owned utilities the profit motive has been institutionalized as a means to motivate utility managers to operate and maintain the utility infrastructure to profitably deliver sales of energy. Some have claimed that decoupling the link between increasing energy sales and increasing profit will change utility organizational culture so that managers and employees focus on things other than sales driven profit. The question here is if the "core business" of a utility is simply sales of therms or if it is a balancing of interests of customers, stockholders and employees. In any event this challenge to decoupling holds no weight in a region known for its municipal utilities and

[37] For this reason and also due to the strict nature of the Washington decoupling mechanism which is balanced towards customer protections we discuss the possible addition of an embedded conditional Lost Revenue Adjustment Mechanism elsewhere in this study.

cooperatives that function well without the profit motivation. In fact utilities are complex high-tech environments full of technical and public service challenges that can result in an organizational structure in which managers and employees are highly functional, highly motivated, and highly alert with or without decoupling.[38]

Low Income. Finally, in Order 06, the Commission expresses an interest in what happens with the low-income program component of energy conservation and, in particular, that Cascade show ability to control results in this program area. The low-income area is discussed in a separate section of this study.

New Customers

While the number of customers per month swings with the cycle of the year, the trend is for an increasing number of customers over the pilot.

The graph for the residential sector (Rate 503) is shown in Figure 7. In the first pilot month, there were 160,107 residential customers and in the final month of the pilot there were 168,158, an increase of 8,051 residential customers or about five percent (5%).

The graph for the commercial sector (Rate 504) is shown in Figure 8. In the first pilot month, there were 22,878 commercial customers and in the final month of the pilot there were 24,203, an increase of 1,345 commercial customers or about five and nine-tenths percent (5.9%). The value of adjusted R-squared for the regression of number of residential customers on pilot month is 0.75. The value of adjusted R-squared for the regression of number of commercial customers on pilot month is 0.74. These results mean that about 75% of the variation in numbers of customers in each rate class is explained simply by the trend line for time.

[38] As noted in 1940 by C. Wright Mills, "...pecuniary vocabularies of motives are apparently now dominant in many sectors of twentieth-century urban America." However, "[w]hat is reason for one man is rationalization for another. The variable is the accepted vocabulary of motives, the ultimates of discourse, of each man's dominant group about whose opinion he cares." In World War II it would have been unusual for corporations to be driven by a profit motive, particularly when the national Office of Price Control dictated movement of production goods and prices and national survival was at stake. Similarly, engineers have always been motivated by the challenge of technical puzzles. Persons with some religious training are often motivated by a desire for public service. In the context of climate change it is quite possible to be motivated strongly by the desire to reduce emissions and to conserve energy. Utilities as organizations recruit from their communities and typically show a strong public service motivation. It is not hard to imagine a utility that has an internal culture that cares about public service, national defense, technical challenges, and the environment because utilities already reflect their communities and select for professional commitment. These motivations are strong with or without the drive for profit being a factor in the mix and people who share these motives within an organization are often alert and proactive. Also, having this diversity of motivations within helps an organization succeed. Mills, C. Wright, "Situated Actions and Vocabularies of Motive," *American Sociological Review*, Vol. 5, December 1940, Pp. 904-913.

Figure 9 and Table 16 show the new customers added each quarter.[39]

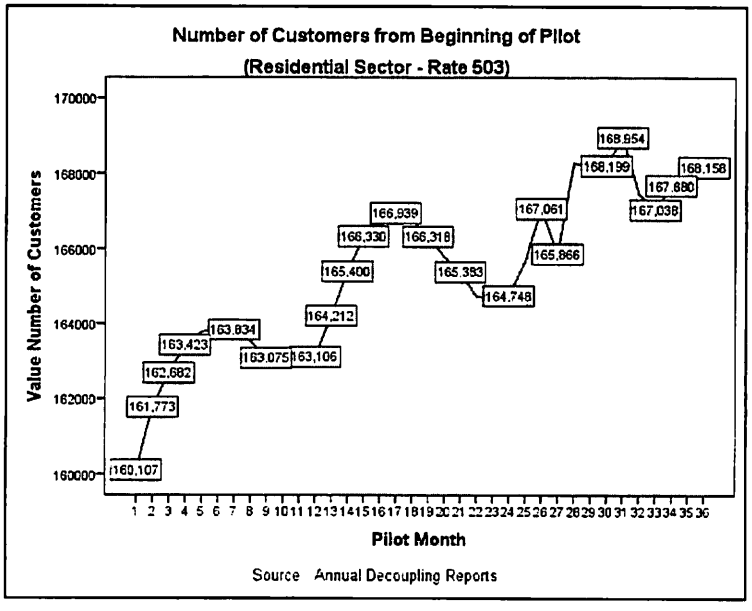


Figure 7: Residential Customers (Rate 503) by Pilot Month.

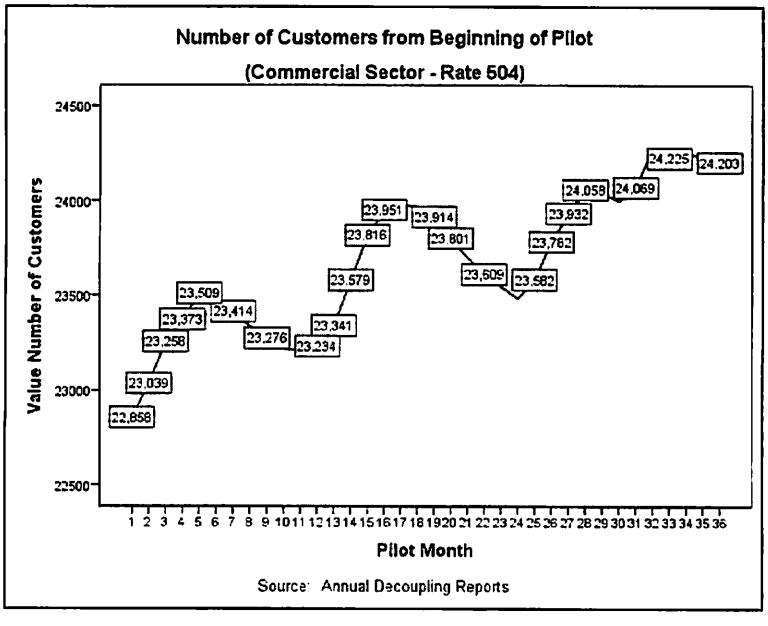


Figure 8: Commercial Customers (Rate 504) by Pilot Month.

[39] Figure 9 and Table 16 are based on the response to Data Request No. 3-9.

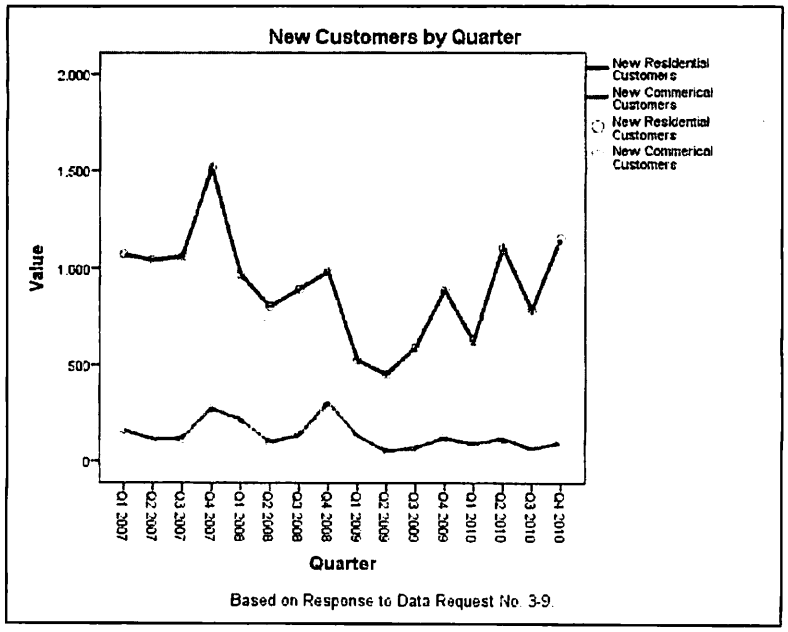


Figure 9: New Customers each Quarter (rate 503 at top; Rate 504 at bottom).

Table 16: New Customers.

Quarter	Residential (Rate 503)	Commercial (Rate 504)
Q1 2007	1072	162
Q2 2007	1041	114
Q3 2007	1061	116
Q4 2007	1515	274
Q1 2008	967	216
Q2 2008	801	98
Q3 2008	890	133
Q4 2008	982	305
Q1 2009	527	134
Q2 2009	450	52
Q3 2009	589	69
Q4 2009	887	122
Q1 2010	624	88
Q2 2010	1109	118
Q3 2010	785	65
Q4 2010	1155	96

Associated Conservation Efforts and Achievements

From the perspectives of most of the parties, the primary reason for the decoupling pilot was to move energy conservation forward. Cascade Natural Gas Corporation has introduced and ramped-up provision of conservation information to customers, energy conservation programs administered through expert delivery agents, and conservation incentives. The yearly conservation targets (previously introduced in Table 1) are reproduced for convenience in Table 17.[40]

Table 17: Conservation Targets.

Conservation Targets			
Calendar Year	**Target Residential & Commercial/Industrial (Therms)**	**Target Low-Income Weatherization Program (Therms)**	**Target Total Annual Savings (Therms)**
2008	322,500	13,125	335,625
2009	415,000	26,250	441,250
2010	530,000	35,500	565,500
Total Pilot	1,267,500	74,875	1,342,375

Basic Outcomes

The basic outcomes for each pilot year are shown in Tables 18-20. In the first two pilot years, CNGC exceeded conservation targets. In the third year CNGC achieved 79% of goal and would have reached 99% of the target of 565,500 therms, except that essential parts for one large custom project were on backorder.[41] For 2008, the Company saved a total of 454,480 therms with about forty-two percent 42% coming from commercial and industrial programs, thirty-two percent (32%) from residential programs, twenty-two percent (22%) form energy savers kits, and about three percent (3%) from the Low-Income Weatherization Assistance Program (Table 18). The actual therm savings are shown graphically in Figure 10.

[40] Calculated as midpoints to values in original Plan table, Docket UG-060256, Order 6, Order Approving Conservation and Low income Weatherization Plan, Subject to Conditions; Authorizing and Requiring Compliance Filing; Denying Public Counsel's Motion for Leave to File Comments, August 16, 2007, Pp 8-9, §§27-30. This information was also provided in response to Data Request No. 8-1.

[41] This was an upgrade of existing catalytic oxidizers which would reduce natural gas consumption required in the oxidation process. It required an independent study. As the study was completed, the vendor lowered promised performance levels for the equipment and a new vendor proposed a different approach. The party doing the independent study confirmed that new approach would work better. At this point a field survey was required. Once the order was placed, weather intervened. There was also damage to a coil during shipping and the part had to be sent back and repaired. This pushed delivery into the next year (2011). The system was operational March 22, 2011. This footnote is based on the response to Data Request No. 9-1.

Table 18: Conservation Performance for 2008.

2008 Pilot Energy Savings				
Sector	Actual (Therms)	Percentage of Actual Total	Target (Therms)	Percentage of Target
Commercial & Industrial	191,837	42.2%	322,500	136.6%
Residential Program	146,676	32.3%		
Energy Savers Kits	101,982	22.4%		
Low-Income Weatherization Assistance Program	13,985	3.1%	13,125	106.6%
Total	454,480	100.0%	335,625	135.4%

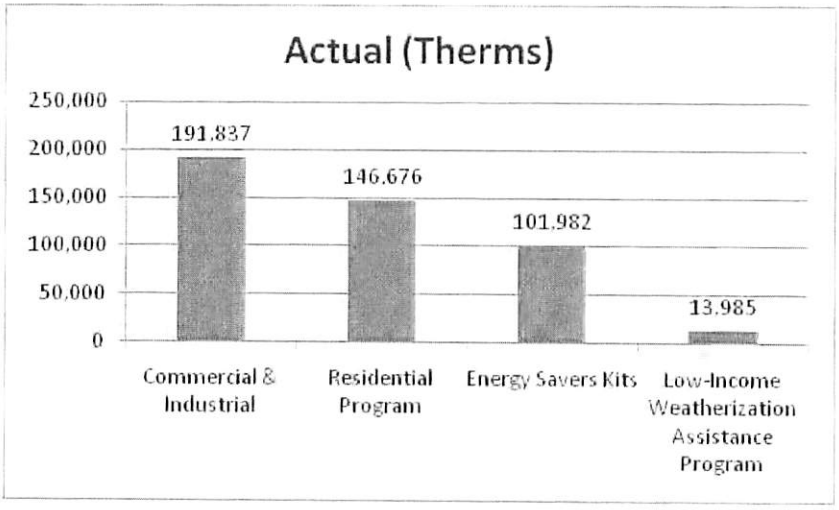


Figure 10: Actual Therm Savings by Program Type (2008).

For 2009, the Company saved a total of 564,170 therms with about forty-eight and nine-tenths percent (48.9%) coming from commercial and industrial programs, forty and one-tenth percent (40.1%) from residential programs, eight and four-tenths percent (8.4%) from energy savers kits, and about two and six-tenths percent (2.6%) from the Low-Income Weatherization Assistance Program (Table 19). These results are pictured graphically in Figure 11.

Table 19: Conservation Performance for 2009.

2009 Pilot Energy Savings				
Sector	Actual (Therms)	Percentage of Actual Total	Target (Therms)	Percentage of Target
Commercial & Industrial	275,604	48.9%	415,000	132%
Residential Program	226,491	40.1%		
Energy Savers Kits	47,342	8.4%		
Low-Income Weatherization Assistance Program	14,733	2.6%	26,250	56%
Total	564,170	100.0%	441,250	128%

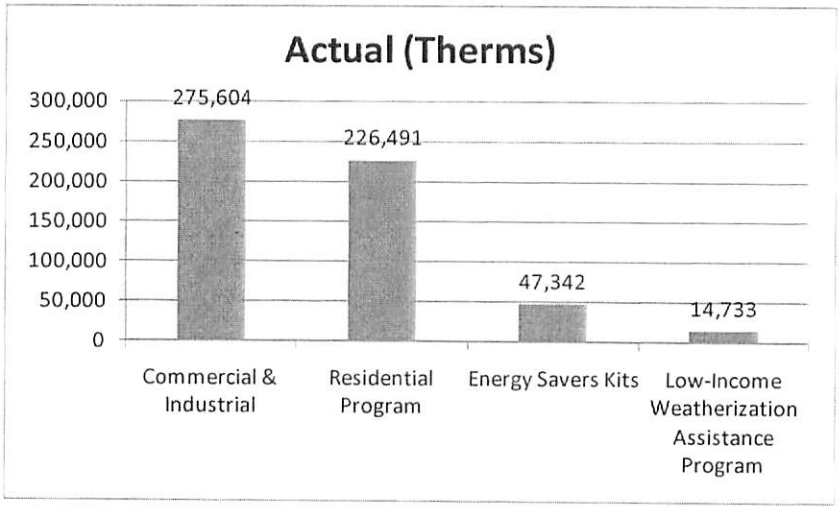


Figure 11: Actual Therms Savings by Program Type (2009)

For 2010, the Company saved a total of 444,581 therms with about fifty and five-tenths percent (50.5%) coming from commercial and industrial programs, forty-two and three-tenths percent (42.3%) from residential programs, three-tenths percent (0.3%) from energy savers kits, and about six and nine-tenths percent (6.9%) from the Low-Income Weatherization Assistance Program (Table 20). These results are shown graphically in Figure 12.

Table 20: Conservation Performance for 2010.

2010 Pilot Energy Savings				
Sector	Actual (Therms)	Percentage of Actual Total	Target (Therms)	Percentage of Target
Commercial & Industrial	224,357	50.5%	530,000	78%
Residential Program	187,871	42.3%		
Energy Savers Kits	1,544	0.3%		
Low-Income Weatherization Assistance Program	30,809	6.9%	35,500	87%
Total	444,581	100.0%	565,500	79%

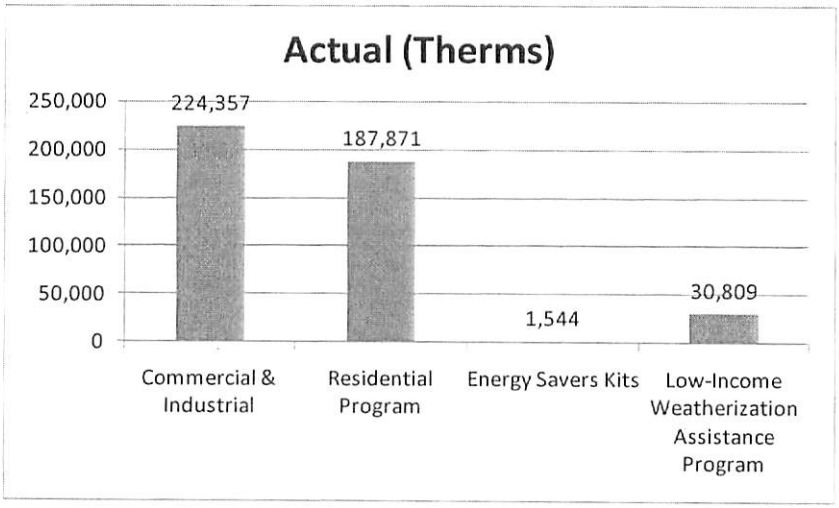


Figure 12: Actual Therm Savings by Program Type (2010)

Looking across the three year pilot, total conservation savings was 1,463,231 therms, with 1,403,704 therms coming from the residential and commercial/industrial programs and 59,537 coming from the Low-Income Weatherization Assistance Program. The full pilot energy savings results are shown in Table 21 and Figure 13.

Table 21: Conservation Performance for Full Pilot.

Three-Year Pilot Energy Savings				
Sector	Actual (Therms)	Percentage of Actual Total	Target (Therms)	Percentage of Target
Commercial & Industrial plus Residential	1,403,704	95.9%	1,278,500	110%
Low-Income Weatherization Assistance Program	59,527	4.1%	74,875	80%
Total	1,463,231	100.0%	1,353,375	108%

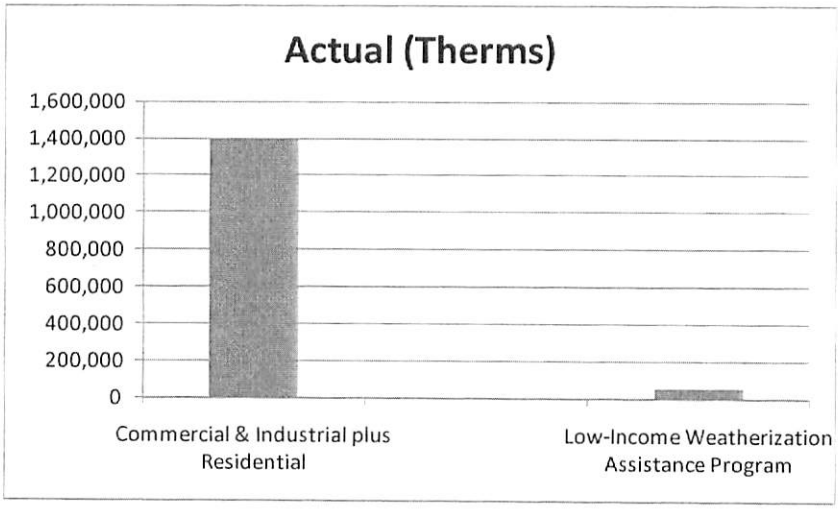


Figure 13: Actual Therm Savings by Program Type (Full Pilot)

All of the conservation effort is cost-effective according to standard cost-testing for energy conservation programs with the understanding that low-income programs are normally exempt from the standard Total Resource Cost (TRC) test. Programs are pre-screened by cost-testing prior to authorization.

List of Conservation Effort

Beginning with decoupling, Cascade Gas introduced a set of energy conservation programs and incentives along with a constant stream of conservation communications with customers. Here is how conservation programs and incentives are currently introduced on Cascade's website (http://www.cngc.com/):

Conservation Incentive Programs

Energy conservation is becoming increasingly important. Using less energy helps protect the environment and saves you money. As energy costs rise, conserving energy has an even greater impact on the financial success of your family or business. In addition to using less energy, you can conserve energy by making energy-efficient improvements to your home or business.

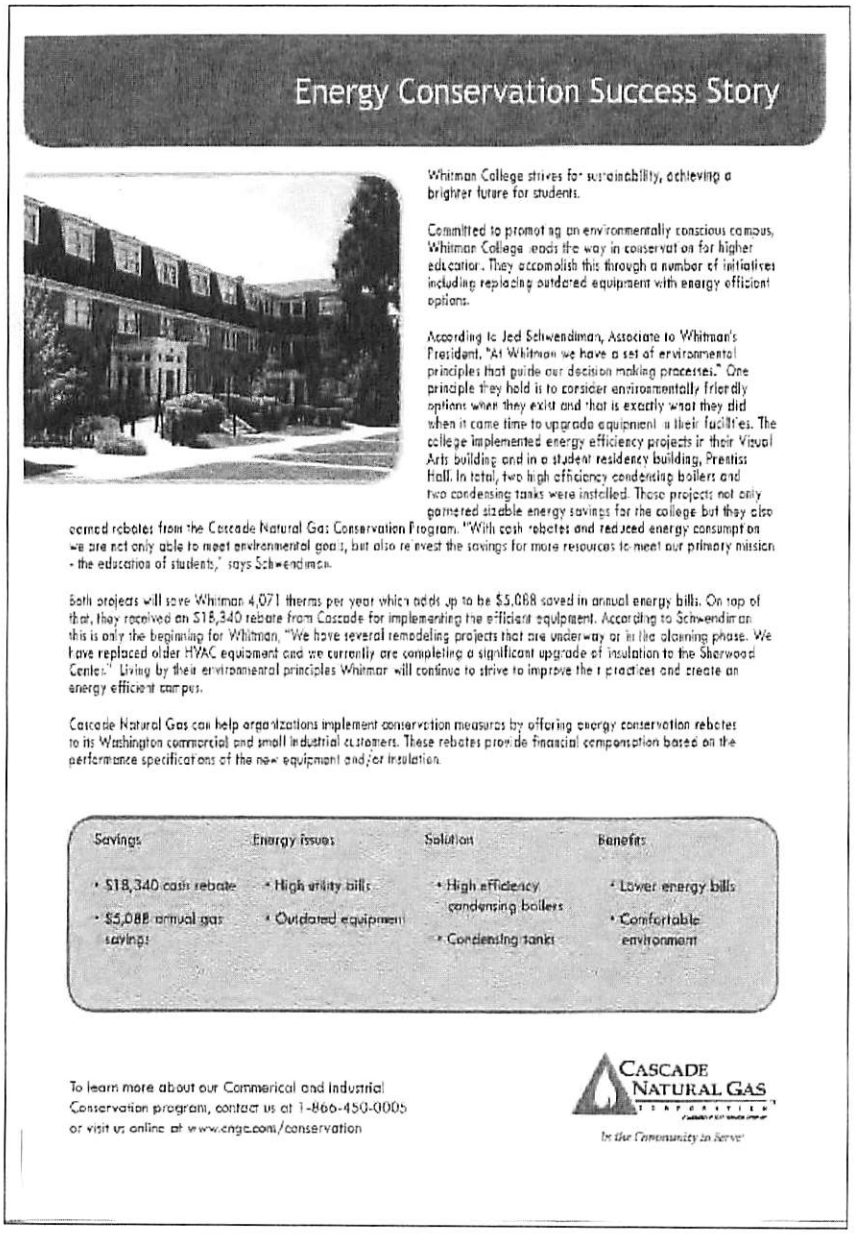
Cascade Natural Gas can now help home and business owners implement conservation measures by offering energy conservation rebates to our Oregon and Washington residential, commercial, and small industrial customers. These incentives provide financial rebates based on the performance specifications of new energy-efficient appliances, insulation, and/or other upgrades implemented in your home or business.

Here is how the low-income weatherization program is introduced on the same page:

Low-Income Customers

Customers on a fixed or limited income, who are unable to afford installing conservation measures in their homes, may qualify for Cascade's low-income weatherization program or other low-income assistance. For more information, and to view the listing of low-income agencies in Cascade's service area, click here.

The website describes how to participate in the energy conservation programs, the types of conservation improvements available to commercial & industrial, residential, and low-income customers and provides information for application to participate. In addition, on the first commercial page on the website there are five commercial & industrial case studies presented. The case study examples enable visualization of the kinds of energy saving opportunities offered. Three of the case studies are reproduced from Cascades Washington website on the following pages. Figure 14 illustrates energy conservation at a Washington college which has a commitment to ongoing energy conservation projects with Cascade Gas. Figure 15 illustrates possibilities for energy conservation at facilities owned by faith based organizations. Energy conservation achieved in food services facilities is reported in Figures 16 & 17. Food services establishments have many natural gas energy conservation possibilities.



Energy Conservation Success Story

Whitman College strives for sustainability, achieving a brighter future for students.

Committed to promoting an environmentally conscious campus, Whitman College leads the way in conservation for higher education. They accomplish this through a number of initiatives including replacing outdated equipment with energy efficient options.

According to Jed Schwendiman, Associate to Whitman's President, "At Whitman we have a set of environmental principles that guide our decision making processes." One principle they hold is to consider environmentally friendly options when they exist and that is exactly what they did when it came time to upgrade equipment in their facilities. The college implemented energy efficiency projects in their Visual Arts building and in a student residency building, Prentiss Hall. In total, two high efficiency condensing boilers and two condensing tanks were installed. These projects not only garnered sizable energy savings for the college but they also earned rebates from the Cascade Natural Gas Conservation Program. "With cash rebates and reduced energy consumption we are not only able to meet environmental goals, but also reinvest the savings for more resources to meet our primary mission - the education of students," says Schwendiman.

Both projects will save Whitman 4,071 therms per year which adds up to be $5,088 saved in annual energy bills. On top of that, they received an $18,340 rebate from Cascade for implementing the efficient equipment. According to Schwendiman this is only the beginning for Whitman, "We have several remodeling projects that are underway or in the planning phase. We have replaced older HVAC equipment and we currently are completing a significant upgrade of insulation to the Sherwood Center." Living by their environmental principles Whitman will continue to strive to improve their practices and create an energy efficient campus.

Cascade Natural Gas can help organizations implement conservation measures by offering energy conservation rebates to its Washington commercial and small industrial customers. These rebates provide financial compensation based on the performance specifications of the new equipment and/or insulation.

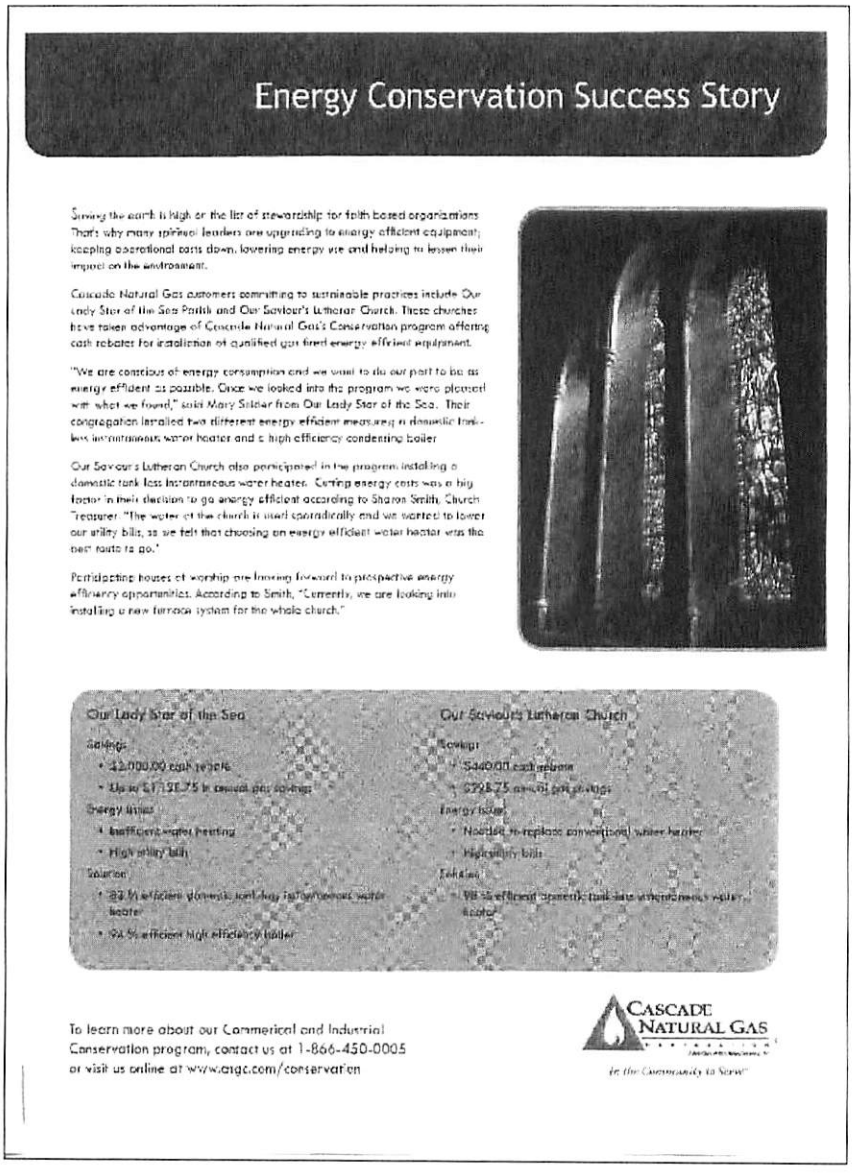
Savings	Energy Issues	Solution	Benefits
• $18,340 cash rebate	• High utility bills	• High efficiency condensing boilers	• Lower energy bills
• $5,088 annual gas savings	• Outdated equipment	• Condensing tanks	• Comfortable environment

To learn more about our Commerical and Industrial Conservation program, contact us at 1-866-450-0005 or visit us online at www.cngc.com/conservation

CASCADE NATURAL GAS

In the Community to Serve

Figure 14: College Conservation Example.



Energy Conservation Success Story

Saving the earth is high on the list of stewardship for faith based organizations. That's why many spiritual leaders are upgrading to energy efficient equipment, keeping operational costs down, lowering energy use and helping to lessen their impact on the environment.

Cascade Natural Gas customers committing to sustainable practices include Our Lady Star of the Sea Parish and Our Saviour's Lutheran Church. These churches have taken advantage of Cascade Natural Gas's Conservation program offering cash rebates for installation of qualified gas fired energy efficient equipment.

"We are conscious of energy consumption and we want to do our part to be as energy efficient as possible. Once we looked into the program we were pleased with what we found," said Mary Soldier from Our Lady Star of the Sea. Their congregation installed two different energy efficient measures a domestic tankless instantaneous water heater and a high efficiency condensing boiler.

Our Saviour's Lutheran Church also participated in the program installing a domestic tank less instantaneous water heater. Cutting energy costs was a big factor in their decision to go energy efficient according to Sharon Smith, Church Treasurer. "The water at the church is used sporadically and we wanted to lower our utility bills, as we felt that choosing an energy efficient water heater was the best route to go."

Participating houses of worship are looking forward to prospective energy efficiency opportunities. According to Smith, "Currently, we are looking into installing a new furnace system for the whole church."

To learn more about our Commerical and Industrial Conservation program, contact us at 1-866-450-0005 or visit us online at www.cngc.com/conservation

CASCADE NATURAL GAS

In the Community to Serve

Figure 15: Faith-Based Conservation Example.

Energy Conservation Success Story

Foodservice Operations Stir Up Savings with Energy Efficiency

Washington area foodservice establishments La Vie en Rose Bakery, Bob's Burgers and Brew and Kelly's O'Deli Catering are turning to energy efficiency to achieve savings and sustainable operations. All three foodservice operations earned cash rebates from the Cascade Natural Gas Conservation Program.

According to Johnny Lohr, owner of La Vie en Rose Bakery, the old oven was no longer making the grade. "Uneven cooking and the time it took to reach operating temperature helped in my decision to look for a new, more efficient gas oven." The rebate offered from Cascade's Conservation program made the choice for an efficient model even easier. "I chose this oven for two reasons: the reliability of the model and the rebate that was offered from Cascade," said Lohr. The bakery is now cutting baking times in half and adding green to their bottom line with reduced energy costs. "The old oven took about 20 minutes to preheat, but the new model only takes eight minutes," said Lohr.

Kelly's O'Deli Catering is seeing the benefits of energy-efficiency. "We now have more equipment, yet our gas bill has not increased," said owner Dianne Blakesley. The catering company installed two high-efficiency convection ovens and a tankless water heater. Affordable energy bills are only half the story. The catering company's tankless water heater provides hot water on-demand—reducing energy costs by eliminating heat up times. Additionally, they are seeing faster baking times with their two convection ovens, providing a more efficient cooking process. According to Blakesley, "I can cook larger quantities of food in a shorter amount of time. It has made a big difference."

La Vie en Rose Bakery

Issues
- Old equipment
- Long start-up and cooking times

Solutions
- High-efficiency gas convection oven

Trade Ally
- Dick's Restaurant Supply

Savings
- $600 cash rebate
- $592 estimated annual gas savings

Benefits
- Lower energy bills
- Faster cooking times

Kelly's O'Deli Catering

Issues
- Needed more equipment for operating
- Old water heater needed replacing

Solutions
- High-efficiency gas convection oven
- Tankless water heater

Trade Allies
- Dick's Restaurant Supply
- Smith Mechanical

Savings
- $1,500 cash rebate
- $1,355 estimated annual gas savings

Benefits
- Lower energy bills
- Faster cooking times

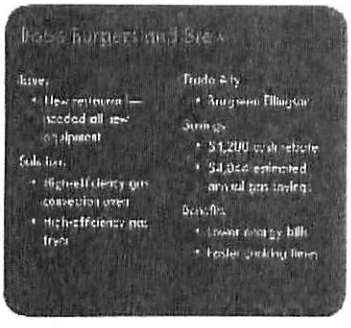
Figure 16: Food Services Conservation Example (Part 1).

When it came time to purchase foodservice equipment for Bob's Burgers and Brew's new location in Yakima, Washington, Cascade's cash rebates proved quite significant. According to owner Rachel Roberts, "Building a new restaurant gets expensive, so we were thankful that the rebates helped offset some of the cost." The new location is realizing savings with their purchase of an energy-efficient gas fryer and convection oven. This equipment can cut energy bills without sacrificing quality or cooking performance.

A Menu of Savings

Collectively these organizations earned rebates totaling $6,300. The savings don't end there – all combined these establishments will save an estimated 5,707 therms annually, equating to $5,991 in estimated annual cost savings. Conservation is not just a part of the picture for these businesses—it is a way of doing business. La Vie en Rose Bakery has cut down their waste to five percent, implemented a recycling and compost program, uses biodegradable to-go utensils and donates leftover food each day to people in need. According to Lahr, they wouldn't have it any other way, "Sustainability is the mantra and creed we live and operate by."

Cascade Natural Gas helps organizations implement conservation measures by offering energy conservation cash rebates to its Washington commercial and small industrial customers. These rebates provide financial compensation based on the performance specifications of the new equipment and/or insulation.



To learn more about our cash rebates for foodservice equipment, contact Autumn Marks at 1.877.508.7116 or visit us online at cngc.com/conservation.

CASCADE NATURAL GAS

Figure 17: Food Services Conservation Example (Part 2).

The low-income program offered by Cascade is coordinated through Community Action Agencies and so is coordinated with compatible federal/state Weatherization Assistance Programs.[42] The residential program is a standalone Cascade program that offers a full set of residential conservation measures. The commercial and industrial program is also a standalone Cascade program with a full set of commercial and industrial prescriptive improvements and has provision for custom measures.

In 2008 there was a strong energy kit focus. However by 2010 the kit component was very small, in part because Cascade found that some participants might think that was enough to do. Cascade's conservation emphasis has shifted toward long-term deep energy savings. Also, beginning with the 2008 experience, and given the national economic crisis and with new construction greatly attenuated in comparison to the years prior to the crisis, it was decided to place more attention on large custom commercial and industrial jobs that would each bring in large amounts of energy savings. At the same time, a full variety of residential and commercial & industrial prescriptive measures continued to be available to customers. In the low-income area, the number of Cascade weatherized homes increased substantially in 2010 over previous years.

In general, we can characterize the level and diversity of conservation information and program effort as substantial during the decoupling pilot.

Deemed Savings

The Cascade pilot has a deemed savings approach without program evaluation. Prescriptive energy savings improvements ("measures") are listed in tables by the Washington Utilities and Transportation Commission.[43] The measures listed are deemed to be cost-effective and may be recommended under the programs. The exception is custom measures which, by definition, are not prescriptive and so cannot be deemed in advance. In this section, we review the "achieved therms" found in the 2008, 2009 and 2010 pilot year decoupling reports with respect to magnitude, cost effectiveness, and distribution.

The review of the achieved therms begins with Tables A and B on page2 of the 2009 decoupling report, which summarizes energy conservation results for 2008 and 2009. For each of these tables there is a measure detail sheet which exactly reproduces the summary savings numbers for the residential and

[42] Coordinating utility and public program low-income weatherization program efforts can provide the most cost-effective low-income weatherization programs. Hill, Lawrence J. & Marilyn A. Brown, "Estimating the Cost Effectiveness of Coordinated DSM Programs." *Evaluation Review*, Vol. 19, No. 2, April 1995, Pp. 181-196.

[43] Washington Utilities and Transportation Commission, Cascade Natural Gas Corporation, WN U-3, Residential Conservation Incentive Program, Third Revision Sheet 300, Effective November 15, 2009; Washington Utilities and Transportation Commission, Cascade Natural Gas Corporation, WN U-3,Low Income Residential Incentive Program, Original Sheet No. 301, Effective October 1, 2007; Washington Utilities and Transportation Commission; Washington Utilities and Transportation Commission, Cascade Natural Gas Corporation, WN U-3, Commercial/Industrial Conservation Program, Substitute Second Revision Sheet No. 302, Effective September 11, 2009; Cascade Natural Gas Corporation, WN U-3, Pilot Residential Low-Flow Showerhead Program, Original Sheet 303, Effective July 1, 2008.

commercial/industrial savings found in the tables. For 2008, the measure detail sheet is "2008 Supplement to Decoupling Report" where the totals from the Total Annual Therm Savings columns for the detailed residential and commercial measure tables will exactly match the summary numbers in Table B. Likewise, the Total Annual Therm Savings columns in the detail sheet "2009 Report Appendix A" will exactly match the summary savings numbers reported in table A. For 2010, there are tables in identical formats.

The detailed measure tables tally the annual program activity in terms of specific measure categories, providing savings, cost, and levelized cost information for an average item in each of the measure categories. These specifics provide points of comparison for the reasonableness of each measure. The principal points of comparison are found in the "Energy Efficiency Resource Assessment Washington Service Territory" by Stellar Processes and Ecotope, 2006. This resource presents detailed measure lists with associated calculations leading to a levelized cost estimate for each measure category.

This resource reflects the costs and savings found in Northwest energy planning by the Energy Trust of Oregon at the time of the report. The levelized cost information in the detailed measure tables does not agree exactly with the levelized cost information found in the Stellar document, but it is reasonably close. The differences lie in different assumed discount rates and other small changes. The measure cost and savings information for the most significant measure categories was also double checked by reference to other resources, and by separate check calculations.

It should be understood that the savings and costs used here are essentially averages applicable to a "measure category" which includes a variety of application circumstances. A particular exact number depends on knowledge of a mix of particular circumstances which is not available. Therefore it is important to recognize that all of these can only be held to the standard of "reasonable ballpark estimates"; they can be compared to other comparable numbers, and they can be checked by approximate calculations, but there is a limit to the exactness of these numbers.

The residential sector is homogenous and the costs and savings assumed for this sector are all quite reasonable. However, the savings for the commercial sector are dominated (about 60%) by custom engineered applications that are both large and unique. There are (by definition, since they are custom jobs) no points of comparison for these unique savings estimates so we have carried out verification on a "due diligence" sample of four, selected by our team for review of utility billing analysis where possible and a review of the engineering calculations.

All of the residential savings and all prescriptive commercial savings are found to be reasonable (also, on Page 58, commercial custom savings are found to be both reasonable and conservatively stated by the Company). In summary, all of Cascade's energy savings results are valid.

The distribution of the savings measures has been reviewed by observing the measures and grouping them into high activity categories for similar types of measures. These high activity categories differ between the residential and commercial sectors.

Residential Sector Activity Distribution

For the residential sector, the high activity categories are:

1) **Appliances.** Appliances include efficient space heaters, DHW heaters, and washers. The common theme of this category is that the measures are essentially appliances that have been rated for efficiency and are purchased as a unit (though some installation may be involved).

2) **Retrofit.** Retrofit includes shell insulation, windows, and duct improvements. The common theme for this category is that the measures are essentially all building activities for an already existing building at the participant site.

3) **Showerheads.** "Showerheads" is a separate category because it has large savings and separate treatment in the program records. An intensive showerhead program was conducted during July and August of 2008 in a Joint Utility Project between Puget Sound Energy, Tacoma Power & Water, Snohomish PUD and Cascade.[44] Cascade did not include savings from this program towards the conservation target.

4) **New Construction.** New construction includes new homes which included Energy Star (including Energy Star Plus) rated new residences with gas space heat. The significant theme for this measure is that the efficiency items are successfully captured and deeply embedded opportunities that would otherwise have become lost-opportunities.

Table 22 shows the 2008, 2009 and 2010 residential energy conservation accomplishments in terms of these activity categories. In this table some of the most prominent savings are in the appliance category and consist principally of 90% furnaces. Table 23 shows how these results were summarized by Cascade in the year-end reports.

Table 22: Residential Gas Savings - Examination Analysis.

Category	2008 Savings		2009 Savings		2010 Savings	
	(Therms)	Percentage	(Therms)	Percentage	(Therms)	Percentage
Appliances	54,390	22%	98,719	36%	99,741	53%
Retrofit	46,938	19%	68,702	25%	44,260	23%
Showerheads	101,217	41%	47,342	17%	1,544	1%
New Construction	20,984	8%	18,211	7%	28,229	15%
Other	25,129	10%	40,839	15%	15,641	8%
Total	248,658	100%	273,813	100%	189,415	100%

[44] Washington Utilities and Transportation Commission, Cascade Natural Gas Corporation, WN U-3, Pilot Residential Low-Flow Showerhead Program, Original Sheet No. 303, effective July 1, 2008.

Table 23: Residential Gas Savings - From Cascade Year-End Reports.

Category	2008 Savings		2009 Savings		2010 Savings	
	(Therms)	Percentage	(Therms)	Percentage	(Therms)	Percentage
Residential	146,676	59%	226,491	83%	187,871	99%
Energy Kits	101,982	41%	47,342	17%	1,544	1%
Total	248,658	100%	273,833	100%	189,415	100%

In the detailed measure tables, the levelized costs and benefit cost ratios for the utility cost test (UCT) and the total resource cost test (TRC) have been developed. These show that there is a favorable benefit cost ratio for the utility cost test for all measures, because the utility cost is limited to the utility's rebate amount which is only a fraction of the first cost of the measure. However, on the TRC test one measure comes in low (below a value of 1.0). Efficient gas furnaces fall into a range from 0.7 to 0.8 on the TRC test. The benefit cost ratio here is, of course, dependent on the cost of gas, and with higher gas prices it would exceed 1, the threshold. This is the only measure, residential or commercial, that showed a deficient total resource cost benefit ratio.

The Retrofit category (Table 22) shows increasing activity from 2008 to 2009, then drops in therms but nearly maintains percentage for 2010. This category has very large potential savings, and this level of activity can only be considered as a beginning ramp-up. The New Construction category pertains to new residential construction. Low activity in this category may be creating lost opportunities. However, due to the sustained national economic crisis the new housing sector is showing very little activity, so the low participation here may simply reflect that economic reality.

The Showerhead category (Table 22) plays a significant role in both 2008 and 2009 then drops substantially in 2010. Showerhead retrofit represents an opportunity that can persist if appropriate showerheads are used. The tariff for the showerhead pilot, WN-U3, defines a low flow showerhead as having a flow of "2 gallons per minute or less at 65 pounds per square inch." This definition is too lenient and will qualify showerheads that are only marginally better than code. An alternative and more common definition would be: "2 gallons per minute or less at 80 pounds per square inch." Cascade did not count savings from the showerhead pilot towards its conservation target.

Finding 11: A tighter specification for showerheads should be used to obtain more conservation savings.

Recommendation 6: Upgrade the showerhead specification to 2 gallons per minute or less at 80 pounds per square inch.

As a reference to the appropriate scale of activities for the categories (Table 22) the Stellar resource assessment is used. This reference posits a full energy conservation deployment scenario where the bulk of the achievable energy conservation potential is achieved in a ten year period. While this projection may be somewhat unrealistic because it lacks appropriate ramp-up periods, the Stellar projection does provide a measure of possible activity levels that are derived from CNG's Washington service territory. Table 24 compares Cascade's activity during the three pilot years against the level of activity that would be required to achieve the bulk of Stellar's estimate of achievable energy potential within ten years. (Note in Table 24 that the activity references can only be developed for the categories found in the Stellar deployment scenario, so there is not a one to one correspondence with the activity categories in Table 22.)

Table 24: Cascade Residential Activity Levels as Percentage of Stellar Projection.

Category	Percentage of Stellar Activity Projection		
	2008 Savings	2009 Savings	2010 Savings
Appliances	23%	41%	36%
Retrofit	9%	7%	3%
New Construction	7%	6%	9%

In table 24 it is evident that the appliance activity, principally efficient gas heaters, is relatively high and shows the promise of achieving an activity level commensurate with the technical potential for CNG's Washington service territory. The retrofit activity is not commensurate with the technical potential, but this type of measure takes time to ramp up, and it does not create lost opportunities if it is not done.

New residential construction is at a very low level. This type of activity includes the use of high efficiency glazing and high insulation levels. At the building stage these efficiencies can be quite cost effective, but after construction they are essentially lost opportunities. The low level of activity for new residential construction may be related to generally lower levels of building activity due to the sustained national economic crisis.

Commercial Sector Activity Distribution

For the commercial/industrial sector the high activity categories are:

1) **Appliances.** Appliances include efficient space heaters and kitchen equipment. The common theme of this category is that the measures are essentially appliances that have been rated for efficiency and are purchased as a unit (though some installation may be involved).

2) **Retrofit.** The retrofit category includes insulation, windows and steam traps. The common theme for this category is that the measures require site building activity.

3) **Custom.** The custom category includes large unique engineered applications. This category includes large re-commissioning jobs that are in fact retrofit activities but which because of size or scope are considered custom activities.

4) **New Construction.** New construction includes the efficiency upgrades that can be cost effectively included in new construction.

Table 25 shows the yearly commercial energy conservation activity in terms of the activity categories for commercial/industrial activity. This table shows that some of the most prominent savings are associated with large custom applications. Notable in this table is the lack of any new commercial DSM activity. Table 26 presents the year-end commercial energy conservation totals as reported each year by Cascade.

Table 25: Commercial Gas Savings - Examination Analysis.

Category	2008 Savings		2009 Savings		2010 Savings	
	(Therms)	Percentage	(Therms)	Percentage	(Therms)	Percentage
Appliances	46,032	19%	33,902	12%	56,329	25%
Retrofit	24,145	10%	81,214	29%	31,654	14%
Custom	121,591	49%	155,573	56%	136,370	61%
New Construction	0	0%	0	0%	0	0%
Other	69	0%	4,915	2%	4	0%
Total	191,837	77%	275,604	100%	224,357	100%

Table 26: Commercial Energy Savings as Reported by Cascade.

Category	2008 Savings		2009 Savings		2010 Savings	
	(Therms)	Percentage	(Therms)	Percentage	(Therms)	Percentage
Commercial	191,837	100%	275,604	100%	224,357	100%
Total	191,837	100%	275,604	100%	224,357	100%

The technical potential work by Stellar and Ecotope indicated that there was significant energy conservation potential in the commercial sector. In like manner to the residential sector, activity references were developed for the commercial sector to show the level of observed activity relative to the activity required to meet the technical potential. Table 27 shows this perspective on the commercial energy efficiency activity.

Table 27: Cascade Commercial Activity as Percentage of Stellar Projection.

Category	Percentage of Stellar Activity Projection		
	2008 Savings	2009 Savings	2010 Savings
New Construction	0%	0%	0%
Retrofit	12%	17%	14%

The categories of the full energy conservation deployment scenario for commercial permit only a very coarse view with just two categories (retrofit and new construction). But even with this coarse view, it is evident that the significant category of new commercial construction is untreated. As with the residential sector this may be due to greatly reduced new commercial construction activity. Table 27 shows an increasing level of activity for commercial retrofit activity even including all the large custom jobs. But this level of activity has much room to grow given the commercial sector technical potential.

Program vs. Non-Program Energy Reductions

In the pilot year ending December 31, 2008, Cascade achieved 454,480 therms of program derived energy reductions (Table 28). For the pilot year ending December 31, 2009, Cascade achieved 564,170 therms of program derived energy reductions (Table 29). For the pilot year ending September 30, 2010, Cascade achieved 444,581 therms of program derived energy reductions (Table 30).[45]

Table 28: Program Energy Reductions (2008)

2008 Conservation Savings	
Rate	Therms
Residential	262,643
Commercial	191,837
Total	454,480

Table 29: Program Energy Reductions (2009)

2009 Conservation Savings	
Rate	Therms
Residential	288,566
Commercial	275,604
Total	564,170

[45] In Table 27, 2008 is a fifteen month year, 2009 is a calendar year and 2010 is a nine-month year from January through September.

Table 30: Program Energy Reductions (2010).

2010 Conservation Savings	
Rate	Therms
Residential	220,224
Commercial	224,357
Total	444,581

If energy use had declined over the three year pilot period, it would be possible to contrast the program energy reductions with total energy reductions and determine energy reductions due to all other factors (except weather normalization). However, in each year, energy use was higher than in the equivalent period of base-year 2006 (Tables 31-33). For this reason it is not possible to estimate non-program energy reductions.

Table 31: Increased Energy Use (2006 vs. 2008).

Rate	2006	2008	Delta
	(Weather Normalized Therms)		
Residential	100,927,127	151,628,815	50,701,688
Commercial	74,834,227	111,115,324	36,281,097
Total	175,761,354	262,744,139	86,982,785

Table 32: Increased Energy Use (2006 vs. 2009).

Rate	2006	2009	Delta
	(Weather Normalized Therms)		
Residential	100,927,127	109,696,042	8,768,915
Commercial	74,834,227	85,364,525	10,530,298
Total	175,761,354	195,060,567	19,299,213

Table 33: Increased Energy Use (2006 vs. 2010).

Rate	Jan-Sep 2006	Jan-Sep 2010	Delta
	(Weather Normalized Therms)		
Residential	63,584,659	70,128,313	6,543,654
Commercial	49,111,007	51,431,471	2,320,464
Total	112,695,666	121,559,784	8,864,118

There is no contradiction in program produced deemed energy savings not showing up on an overall summary of therms used for a given year (whatever happens to selected components of a system does not necessarily reflect the behavior of the system as a whole). It might have been expected at the level

of an abstract model of decoupling that energy use would decrease each year of the decoupling pilot, especially given the sustained downturn in the economy due to the continuing national economic crisis. The delta from the base year in terms of weather-normalized therms would then be explainable in two parts – the part due to program produced energy conservation and all other factors (exclusive of weather). However, for this pilot in each pilot year total energy use (in therms) increased.

Program Costs and Energy Savings

Expenditures for conservation efforts include incentives paid and programmatic costs (staff, delivery agents, overheads, etc.). Incentives are shown in Table 34, programmatic costs in Table 35, and total conservation costs are reported in Table 36.

Table 34: Conservation Incentives Paid.

Incentives Paid				
Year	Residential	Commercial	Low Income	Total
	(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)
2008	$603,481	$217,671	$95,344	$916,496
2009	$826,412	$447,898	$168,378	$1,442,688
2010	$539,849	$457,546	$353,141	$1,350,536
Total	$1,969,742	$1,123,115	$616,863	$3,709,720

Table 35: Programmatic Conservation Costs.

Energy Conservation Programmatic Costs				
Year	Residential	Commercial	Low Income	Total
2008	964,966	403,662	97,362	1,465,990
2009	1,108,104	598,196	74,387	1,780,687
2010	1,319,100	806,541	63,984	2,189,625
Total	3,392,170	1,808,399	235,733	5,436,302

Table 36: Total Conservation Costs.

Total Energy Conservation Costs				
Year	Residential	Commercial	Low Income	Total
2008	1,568,447	621,333	194,724	2,384,504
2009	1,934,516	1,046,094	242,765	3,223,375
2010	1,858,949	1,264,087	417,125	3,540,161
Total	5,361,912	2,931,514	854,614	9,148,040

Conservation costs are passed on to all Core rate schedules (502, 503, 504, 505, 511, 570, and 577). There is no special allocation formula used to develop the rate, rather the rate is developed based on dividing the costs by the total core therms associated with the applicable rate schedules.[46] The temporary rate increments associated with conservation costs[47] have been as shown in Table 37 and the impact on different energy use amounts is shown in Table 38. The last line in both tables reflects the ramp-up of conservation work but also includes two years.[48]

Table 37: Conservation Temporary Rate Increments.

Temporary Rate Increments Associated with Conservation Costs	
Duration	Increment
November 2005 through October 2007	$0.00155
November 2007 through October 2008	$0.00160
November 2008 through October 2010	$0.00257
November 2010 thorough present	$0.02477

[46] Based on response to Data Requests 5.10 & 5.12. Transportation (non-core) customers are exempt from surcharges associated with conservation costs as they are not eligible for programs.

[47] The values in Table 37 are based on the response to Data Request No. 5-8.

[48] In 2009, the company did not file a temporary adjustment filing and therefore the 2010 PGA included two years worth of programmatic cost deferrals (*i.e.*, deferred balances from July 2008 thru June 30, 2010). Source: E-mail to Gil Peach from Kathie Barnard on May 22, 2011.

Table 38: Bill Adder for Conservation Costs.

Annual Impact of Temporary Rate Increments Associated with Conservation Costs by Annual Number of Therms Used							
Dates	Therms						
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
	300	660	710	1800	2400	3295	4500
11/07-10/07	$0.47	$1.02	$1.10	$2.79	$3.72	$5.11	$6.98
11/07-10/08	$0.48	$1.06	$1.14	$2.88	$3.84	$5.27	$7.20
11/08-11/10	$0.77	$1.70	$1.82	$4.63	$6.17	$8.47	$11.57
11/10 ->	$7.43	$16.35	$17.59	$44.59	$59.45	$81.62	$111.47
Note: The average Rate 503 residential customer is represented by 660 or 710 therms (Cols. 2 & 3); the average Rate 504 commericial customer by 3,295 therms (Col. 6).							

Table 39 repeats Table 37, but with an additional column to illustrate the energy conservation ramp-up coincident with the decoupling pilot. The "% Increase" column in this table is set to take the pre-pilot energy conservation rate adder as the baseline and express subsequent rate-adders as a percentage of the baseline. The pattern is that of a "floor effect" which occurs with every start-up when expressed in terms of percentage increases. Still, the comparison shows a meaningful and substantive ramp-up of conservation activity on the part of Cascade.[49]

Table 39: Increase in Conservation Costs.

Temporary Rate Increments Associated with Conservation Costs		
Duration	Increment	% Increase
November 2005 through October 2007	$0.00155	0%
November 2007 through October 2008	$0.00160	3%
November 2008 through October 2010	$0.00257	66%
November 2010 thorough present	$0.02477	1498%

[49] The value for November 2010 through the present in the last line of Table 39, while reflecting the ramp-up also includes two years (see previous footnote). This is a small effect but it is present. The primary effect is on percent increase is due to the ramp-up.

Sequencing of Change

A numerical indicator of change in Cascade's conservation effort is shown in the final column in Table 39 above. For 2008, Cascade ramped residential, commercial and low-income programs beginning in October 2007. A substantial effort in the first year was placed in the area of energy kits. Also, for two months during the summer of 2008, Cascade had a special promotion of free showerheads in cooperation with several other Washington utilities in a joint utility project (savings from this special promotion were not counted toward the conservation target). In its report on 2008 activity, Cascade notes the loss of potential in new construction due to the economic downturn in the new construction market. This downturn continues as "bottom bouncing" in the sustained US economic crisis. For 2009, in response to these changes in economic conditions, strategy evolved to focus on a combination of "larger, high yield custom commercial projects balanced with a series of smaller but highly effective prescribed measures in both residential and commercial programs."[50] This strategy continued throughout 2009 and 2010.

During 2009, as a part of the American Reinvestment and Recovery Act (ARRA), the community-based agencies though which Cascade implements low-income energy conservation received directives to serve more homes with fewer energy saving measures. Since Cascade low-income effort is not independent but works through a coordinated program arrangement, the application of Cascade low-income energy conservation dollars followed this same pattern. This resulted in a greater number of households served but lower therm savings than anticipated. Therms saved dropped from about 325 per customer in 2008 to approximately 243 per customer in 2009, a loss of about 30% in savings per home.[51] Also in 2009, recognizing the barrier to conservation put in place by the sustained US economic troubles, Cascade communicated to customers about available incentives.

During 2010, Cascade consolidated program delivery in a single delivery agent. This change was prompted in part by concerns about one contractor's ability to meet targets efficiently and cost-effectively in the context of declining avoided costs. Using a single contractor was expected to improve economies of scale and eliminate duplication of effort. Also in 2010 Cascade strategy moved towards more emphasis on deeper energy savings and measures with longer productive lives. Concurrently, a decision was taken to meaningfully reduce the offering of energy kits because kit customers may be satisfied with taking that first step, rather than going on to do major measures with deeper energy savings.[52] The Company also increased low-income customer participation by working closely with Community Action Agencies and reports that it is working "at the state and agency level to better understand any remaining obstacles to the use of Company dollars, and to encourage all agencies with CNGC's service territory to participate in [CNGC's] programs."[53]

[50] Cascade Natural Gas, Annual Decoupling Mechanism Report for Calendar Year 2008, P. 2.

[51] Cascade Natural Gas, Annual Decoupling Mechanism Report for Calendar Year 2009, P. 2.

[52] Cascade Natural Gas, Annual Decoupling Mechanism Report Calendar Year 2010, Pp. 2-3.

[53] Cascade Natural Gas, Annual Decoupling Mechanism Report Calendar Year 2010, P. 3.

Numbers Served

Numbers of customers served for each year of the pilot and in total are shown in Table 40.

Table 40: Numbers of Customers Served.

Customers Served					
Year	**Residential**	**Energy Kits**	**Commercial**	**Low-income**	**Total**
2008	2,283	3,586	44	43	5,956
2009	4,042	1,636	126	54	5,858
2010	2,257	76	90	112	2,535
Total	8,582	5,298	260	209	14,349

Source: Table B: 2009 Achievements from 2009 Annual Decoupling Mechanism Report; Table C: Final 2009 Achievements & Table A: 2010 Program Achievements from 2010 Annual Decoupling Mechanism Report.

Cascade's Savings Estimates

As discussed in the sub-section on Deemed Savings, Cascade's savings estimates for prescriptive measures are based on a study by Stellar Processes. This incorporates values from the Energy Trust of Oregon and the Regional Technical Forum. Our assessment is that these prescriptive values are valid. Custom measures, by definition, cannot be deemed and tabled. For due diligence, we have checked four large custom projects and find that our estimate of energy savings for these projects somewhat exceeds that of the Company.

Assessment

No independent evaluation was required for the Cascade Washington decoupling pilot other than the current study. In general, energy conservation programs should be subject to independent evaluation inclusive of "due diligence" savings verification with on-sites.

Finding 12: The pilot did not include an independent third-party evaluation of energy savings results.

Recommendation 7: In any future energy conservation effort, provision for periodic independent evaluation of energy savings claimed by the Company and/or the delivery agent should be included in the project design. This evaluation should include an on-site inspection component.

Corporate Perspective - Philosophy & Efforts

An acquisition usually has a large influence on company style and internal organizational culture. Duplication of functions is eliminated, sizes of essential work groups are re-set, job titles and descriptions are conformed to fit the combined company. The acquisition of Cascade by MDU Resource Group officially occurred July 2, 2007.[54] In the acquisition, there were major changes in staff and the Cascade headquarters was moved from Seattle (population 608,660) to Kennewick (population 67,814). The officers of the company are virtually all now from MDU Resource Group. In other words, Cascade Washington is not run by the set of Cascade officers who set the decoupling pilot in motion.[55] And, the new officer group has decided not to request a continuation of the decoupling pilot. However, the Company views decoupling and conservation positively:[56]

> Cascade still views decoupling as an ideal means of supporting its aggressive conservation efforts even though the Company was not able to recover the lost revenue associated with its conservation efforts during CY08 and CY09. Regardless of this experience, the Company maintains its support for a balanced decoupling mechanism that is protective, fair and equitable to our customers while keeping the Company whole from losses due to reductions to usage.
>
> However, we would express strong preference for the full decoupling mechanism utilized by the Company in Oregon, which includes the effects of weather and allows for full recovery of margin differences. This mechanism has been positively evaluated by Black & Veatch, the independent third party selected by the Oregon Public Utility Commission and Cascade Natural Gas in collaboration with parties to the mechanism agreement. The Company believes this Oregon mechanism has had a positive impact on both the Company and its customers and would like to see a similar model implemented in Washington State.

[54] The initials "MDU" derive from Montana Dakota Utilities. MDU Resource Group is based in Bismarck, North Dakota and consists of Montana-Dakota Utilities Company, Great Plains Natural Gas Company and Cascade Natural Gas. In addition MDU Resources has several other business ventures, primarily related to natural resources and energy.

[55] The Settlement Agreement creating the decoupling pilot is in UG-060246, Order 05, effective January 12, 2007. These proceedings began in early 2006.

[56] The quotation in the text box on this page is the response to Data Request No. 4-5.

The point of a pilot, of course, is a mutual agreement of parties to run a test. The parties agree to a pilot and the pilot is run to gain experience. Then each party decides if decoupling worked from their own perspective, in terms of their own objectives and interests and whether or not continuation appears warranted. At the same time, from this process, repeated at different utilities, the Commission gathers experience on decoupling and other approaches to providing effective incentives to energy conservation.

At the end of the pilot, our analysis is that there was no return of lost margins to the company from the decoupling pilot in any of the three pilot years. Cascade's advantage in taking on the pilot was as a hedge against loss of sales. Or, if preferred, the decoupling pilot might be thought of as taking out an insurance policy for an event that did not occur, so there was no collection on the policy by Cascade in any of the three pilot years (but it had the value of coverage for lost margins due to conservation and non-weather related reasons during the pilot).

Throughout the pilot, Cascade Washington has been a healthy, profitable enterprise with increasing sales of therms even given the sustained national economic crisis. Energy use per home is stable and the number of homes served is slowly growing. Energy use per firm in the commercial sector is slowly increasing as is the number of commercial customers. In the first year of the pilot there was a refund to the customers under the decoupling mechanism. In the second and third years, the Company did well financially and was already over the earnings cap so there was no additional collection from the customers for lost margins under the decoupling mechanism.

Given the understanding that a decoupling mechanism is essentially an agreement and that there was no financial return to Cascade, the result from this pilot is a substantial energy conservation benefit for customers and the Company. That Cascade carried through to launch and sustain substantial conservation communications, programs and incentives demonstrates substantial good faith effort on the part of Cascade.

Finding 13: There was no financial return to Cascade as a result of the pilot. However, the decoupling mechanism did provide a kind of hedge.

Finding 14: That Cascade carried through to launch and sustain substantial conservation communications, programs and incentives demonstrates the integrity of Cascade's commitment to their side of the business arrangements set forth in the Settlement Agreement and demonstrates a substantial good faith effort on the part of Cascade.

Operating Practices Related to Conservation

The Company launched and then ramped-up a full set of conservation programs, incentives, and continuous communication with customers about energy conservation. The communications efforts initiated by the Company are frequent, well designed and attractive. The incentives are realistic given the application of the Total Resource Cost (TRC) test and the cost-effectiveness limits set by the combination of the TRC and the findings of Cascade's Integrated Resource Plan (IRP).[57] The programs have been well constructed and the Company has operated them through select expert national delivery agents. The conservation staff is focused on their work and effective.

Organizational Changes Since January 2007

In 2005, Cascade had no dedicated energy conservation staff. Rather, conservation functions were at a much lower level of activity than today and were covered as additional duties within Regulatory Affairs. In November 2006, one Conservation Resource Specialist position was added to Regulatory Affairs, the first dedicated energy conservation position. In January of 2008, a conservation management position was added. In June of 2008, a low-income conservation program position administrator was added. This brings conservation staff to the current level of three full-time staff positions. In 2010, job titles and descriptions were conformed from the previous Cascade classification system to the new MDU Resource Group system.

The individuals in this group have the right skill sets and experience and are highly qualified.

Behavior/Commitment

The Residential Conservation Incentive Program and the Commercial/Industrial Conservation Program became effective October 1, 2007. The low-income program also became effective October 1, 2007. A one-time, two-month inter-utility showerhead promotion was introduced in the summer of 2008. The addition of Energy Kits to the residential program became effective October 8, 2008.[58]

[57] This does not mean the incentives are optimal from a marketing and promotional perspective or from a climate change perspective. However, they are optimal within the current limitations set by the relevant Integrated Resource Plan and the Total Resource Cost test which inform the terms and conditions for all energy efficiency programs that derive from a Demand-Side Management (DSM) and IRP perspective (*i.e.*, they conform to rules of current practice as set by the Washington Utilities and Transportation Commission).

[58] Dates in this paragraph are from the following rate pages: Washington Utilities and Transportation Commission, Cascade Natural Gas Corporation, WN U-3, Residential Conservation Incentive Program, Original Sheet 300, Effective October 1, 2007; Washington Utilities and Transportation Commission, Cascade Natural Gas Corporation, WN U-3,Low Income Residential Incentive Program, Original Sheet No. 301, Effective October 1, 2007; Washington Utilities and Transportation Commission; Washington Utilities and Transportation Commission, Cascade Natural Gas Corporation, WN U-3, Commercial/Industrial Conservation Program, Original Sheet No. 302, Effective October 1, 2007; Cascade Natural Gas Corporation, WN U-3, Pilot Residential Low-Flow Showerhead Program, Original

As discussed previously, the programs were launched and ramped-up. The quality of both energy conservation communications and programs is high. The Company has three dedicated staff to manage and analyze the conservation programs. Staff has proper skills sets and experience and is highly qualified. The general direction of conservation strategy is moving towards deeper and more lasting energy savings. This is the correct direction for energy conservation given the challenges of controlling emissions and putting meaningful energy conservation in place.

We found no downside to Company behavior and staff and delivery agent effort and commitment throughout the pilot.

List of Venues

The following is a list of energy efficiency and conservation-oriented organizations that Cascade has joined since implementation of the pilot:

- **Consortium for Energy Efficiency (CEE)**, since 2008 and served as 2009 and 2010 sponsor of ESTAR Water Heat Campaign
- **Built Green of Tri Cities & Walla, Built Green Whatcom, Build Green of Skagit & Island County and Central Washington Built Green**, since 2008 or 2009
- **Mid-Columbia Sustainable Energy & Environmental Network (SEE Net)**, since 2008, sponsor and participant
- **Northwest Clean Air Agency of Northwest Washington's Climate Action Northwest (CAN) working group**, beginning in 2011, member
- **Sustainable Whidbey Coalition**, beginning in 2011, member

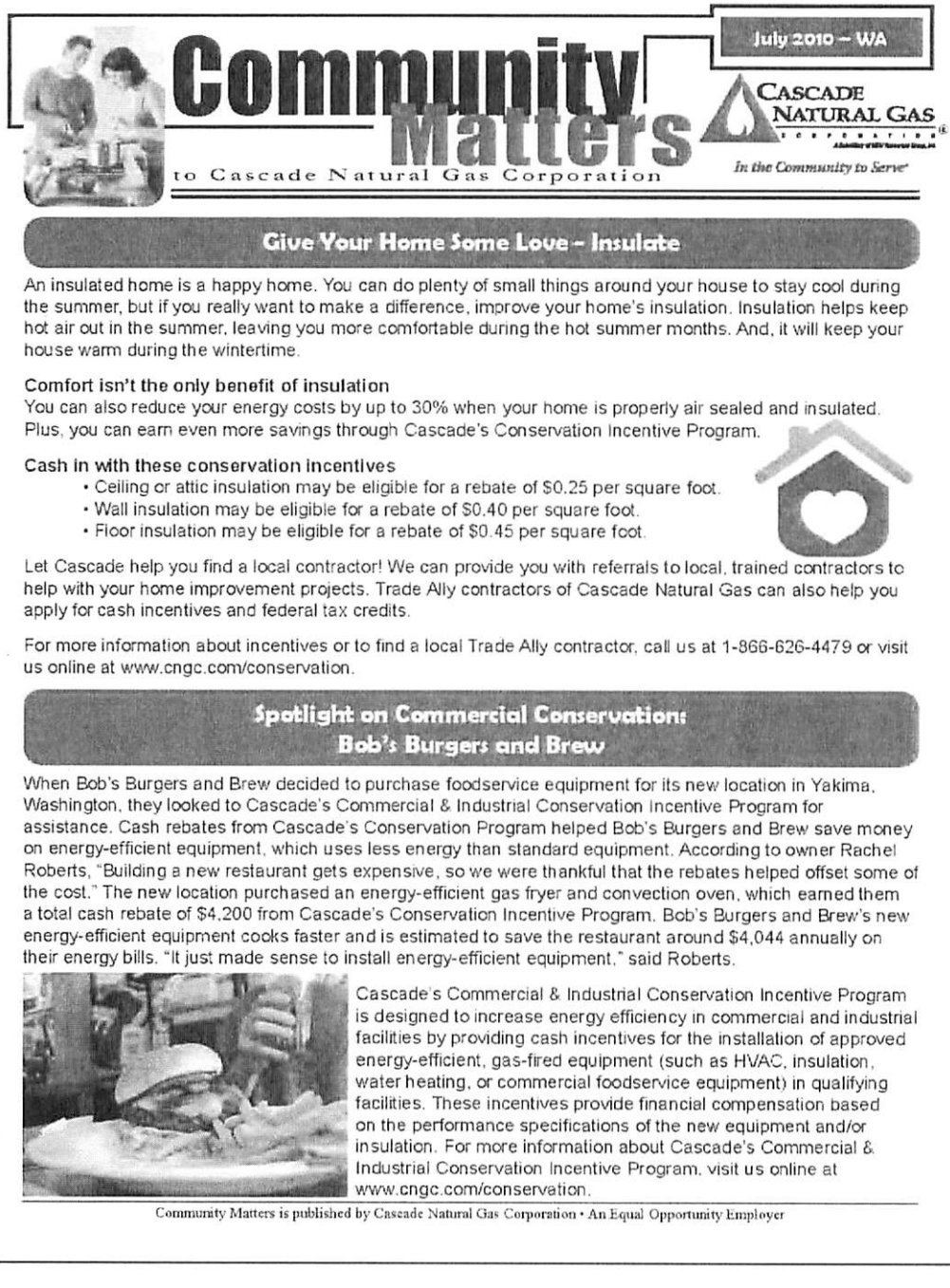
Energy efficiency and conservation-oriented initiatives since the beginning of the pilot include:

- **Greenest House.** Sponsorship and in-kind support of the Greenest House Reality Show filmed in Bellingham, WA during 2008 (aired in 2009). Several of Cascade's CIP contractors were featured in the show as they performed energy audits and other related work.
- **Community Energy Challenge.** Sponsor of the Sustainable Connections Community Energy Challenge in Whatcom County. Provides financial and in-kind support, including joint messaging, usage data (upon customer approval), etc. (since 2008 and ongoing).
- **Sustainable Living Center.** Financial and significant in-kind support of the Sustainable Living Center of Walla Walla's community weatherization campaign. CNGC provides access to Energy Savers kits for distribution to qualified customers, training and technical assistance, usage information (upon customer approval) and other efforts as needed (since 2009 and ongoing).

Sheet 303, Effective July 1, 2008. Savings from the showerhead program were not counted towards the conservation target.

- **Skagit Home Certification.** Cascade has engaged with the Skagit County Commissioner's Office to offer support of their newly developing Sustainable Skagit Home Certification Program (since 2010 and ongoing).

During the pilot, Cascade distributed conservation messaging in Washington through its Community Newsletter, through pro-conservation bill inserts, through the cascade website, and through advertisements. Through the surveys we also know that many customers became aware of the energy efficiency program through Cascade's efforts to inform contractors as to the availability of paid incentives. Samples follow (Figures 18-24).



July 2010 – WA

Community Matters

to Cascade Natural Gas Corporation

Cascade Natural Gas Corporation

In the Community to Serve®

Give Your Home Some Love – Insulate

An insulated home is a happy home. You can do plenty of small things around your house to stay cool during the summer, but if you really want to make a difference, improve your home's insulation. Insulation helps keep hot air out in the summer, leaving you more comfortable during the hot summer months. And, it will keep your house warm during the wintertime.

Comfort isn't the only benefit of insulation

You can also reduce your energy costs by up to 30% when your home is properly air sealed and insulated. Plus, you can earn even more savings through Cascade's Conservation Incentive Program.

Cash in with these conservation incentives

- Ceiling or attic insulation may be eligible for a rebate of $0.25 per square foot.
- Wall insulation may be eligible for a rebate of $0.40 per square foot.
- Floor insulation may be eligible for a rebate of $0.45 per square foot.

Let Cascade help you find a local contractor! We can provide you with referrals to local, trained contractors to help with your home improvement projects. Trade Ally contractors of Cascade Natural Gas can also help you apply for cash incentives and federal tax credits.

For more information about incentives or to find a local Trade Ally contractor, call us at 1-866-626-4479 or visit us online at www.cngc.com/conservation.

Spotlight on Commercial Conservation: Bob's Burgers and Brew

When Bob's Burgers and Brew decided to purchase foodservice equipment for its new location in Yakima, Washington, they looked to Cascade's Commercial & Industrial Conservation Incentive Program for assistance. Cash rebates from Cascade's Conservation Program helped Bob's Burgers and Brew save money on energy-efficient equipment, which uses less energy than standard equipment. According to owner Rachel Roberts, "Building a new restaurant gets expensive, so we were thankful that the rebates helped offset some of the cost." The new location purchased an energy-efficient gas fryer and convection oven, which earned them a total cash rebate of $4,200 from Cascade's Conservation Incentive Program. Bob's Burgers and Brew's new energy-efficient equipment cooks faster and is estimated to save the restaurant around $4,044 annually on their energy bills. "It just made sense to install energy-efficient equipment," said Roberts.

Cascade's Commercial & Industrial Conservation Incentive Program is designed to increase energy efficiency in commercial and industrial facilities by providing cash incentives for the installation of approved energy-efficient, gas-fired equipment (such as HVAC, insulation, water heating, or commercial foodservice equipment) in qualifying facilities. These incentives provide financial compensation based on the performance specifications of the new equipment and/or insulation. For more information about Cascade's Commercial & Industrial Conservation Incentive Program, visit us online at www.cngc.com/conservation.

Community Matters is published by Cascade Natural Gas Corporation • An Equal Opportunity Employer

Figure 18: Newsletter.

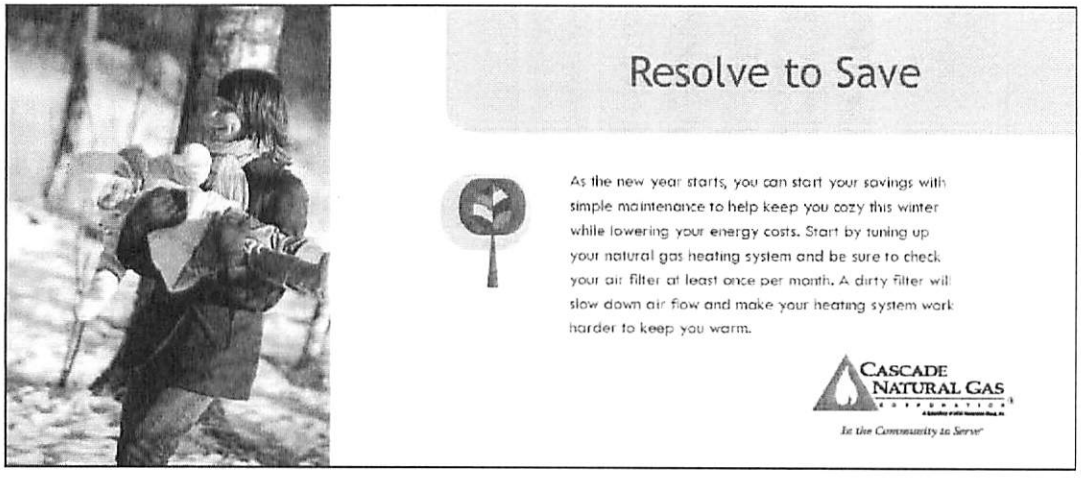


Figure 19: Bill Insert - Resolve to Save.

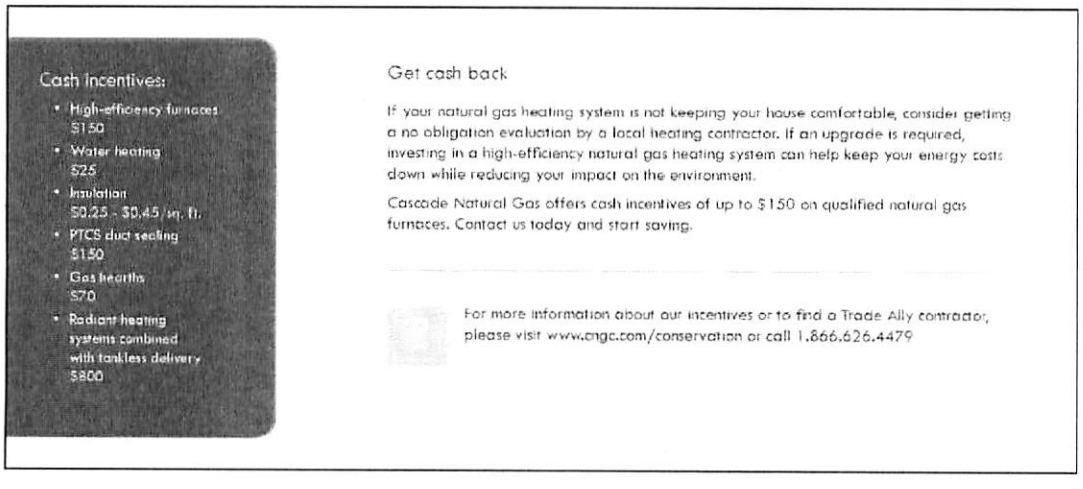


Figure 20: Bill Insert - Get Cash Back.

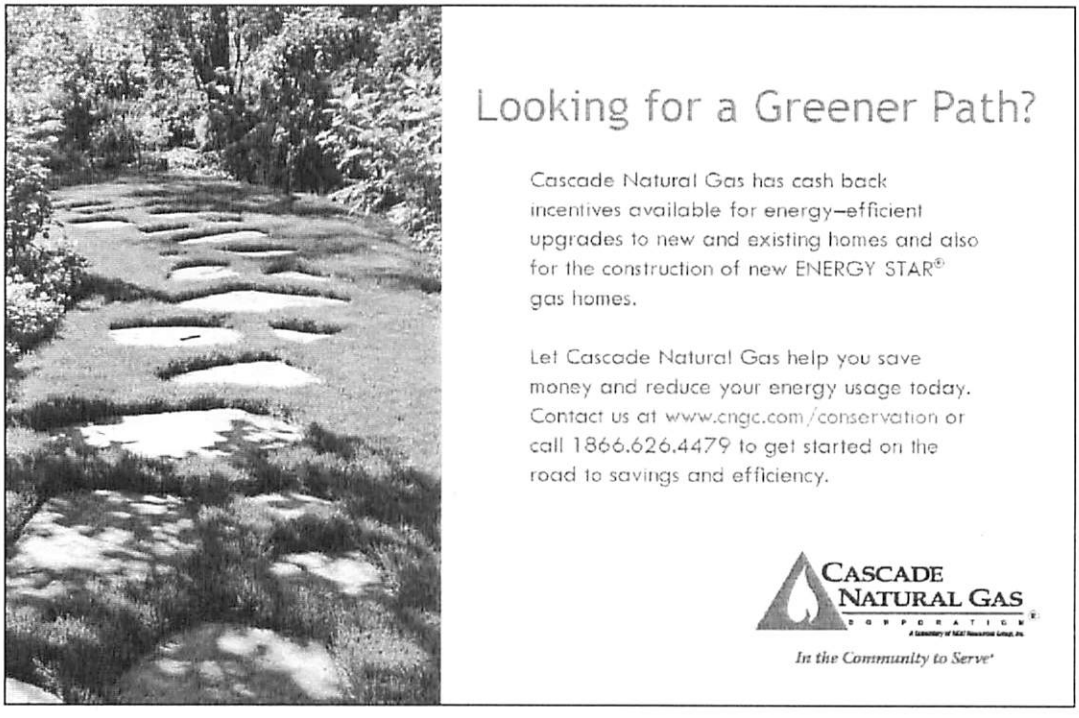


Figure 21: Advertisement - Looking for a Greener Path.

Figure 22: Bill Insert – Keep Out the Cold.

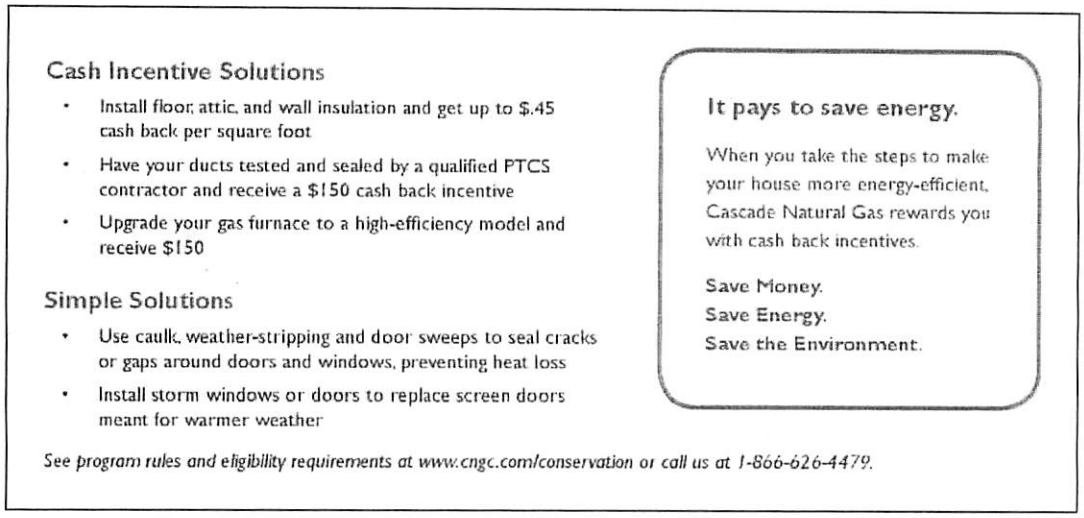


Figure 23: Bill Insert – Cash Incentive Solutions.

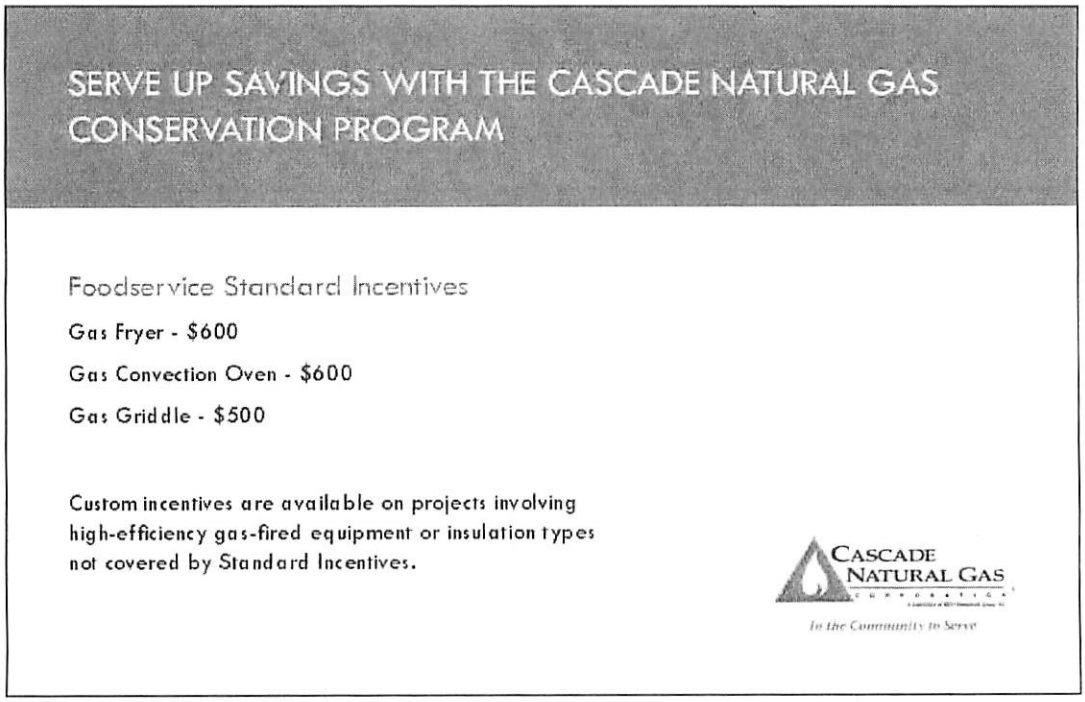


Figure 24: Trade Ally Contact Card - Food Services.

Rate Designs and the Effects of Weather

This section of the study looks at two separate questions. First, what would happen to bills if the weather normalization procedure were to be eliminated but the mechanism in all other respects kept? Second, what could be done to improve rate design so as to encourage energy conservation while removing volatility for customers and stabilizing revenue for the Company?

Weather-Related Impact

If weather normalization were to be eliminated from the mechanism, but with the mechanism kept in all other respects the same, the effect created in the working of the mechanism would be influenced by weather in both the baseline year and in each pilot year analyzed. The differences by month start out small but then amplify in each calculation step. Essentially what weather normalization does for the mechanism is to "damp down" the ultimate refund to the customers or payment to the Company by removing weather effects from the calculations.

To take weather into the mechanism, first, weather has to be restored to the baseline year to develop new values of the Baseline Year Commodity Margin per Customer. Results from this step are shown in Tables 41 & 42. Note that for some months the changes are quite small but for others the changes are large. In the following step, these results will be multiplied by numbers of customers each month, amplifying the differences.

Table 41: Baseline Year Effect of Weather on Commodity Margin per Residential Customer.

Residential (Rate 503)				
Month	Baseline Average Commodity Margin/Customer			
	Weather Removed	Weather Not Removed	Difference	%
(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)	(Col. 5)
Jan	$ 32.14	$ 33.82	$ 1.68	5.2%
Feb	$ 17.82	$ 18.42	$ 0.60	3.4%
Mar	$ 18.33	$ 17.15	$ (1.18)	-6.4%
Apr	$ 16.10	$ 16.21	$ 0.11	0.7%
May	$ 7.05	$ 5.43	$ (1.62)	-23.0%
Jun	$ 6.44	$ 6.35	$ (0.09)	-1.4%
Jul	$ 4.65	$ 4.16	$ (0.49)	-10.5%
Aug	$ 4.69	$ 4.26	$ (0.43)	-9.2%
Sep	$ 5.30	$ 6.33	$ 1.03	19.4%
Oct	$ 11.82	$ 11.42	$ (0.40)	-3.4%
Nov	$ 22.70	$ 23.56	$ 0.86	3.8%
Dec	$ 32.66	$ 29.37	$ (3.29)	-10.1%

Table 42: Baseline Year Effect of Weather on Commodity Margin per Commercial Customer.

Commercial (Rate 504)				
Month	Baseline Average Commodity Margin/Customer			
	Weather Removed	Weather Not Removed	Difference	%
(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)	(Col. 5)
Jan	$ 131.95	$ 138.21	$ 6.26	4.7%
Feb	$ 84.72	$ 86.03	$ 1.31	1.5%
Mar	$ 74.05	$ 69.68	$ (4.37)	-5.9%
Apr	$ 62.45	$ 62.49	$ 0.04	0.1%
May	$ 34.28	$ 29.45	$ (4.83)	-14.1%
Jun	$ 33.74	$ 33.49	$ (0.25)	-0.7%
Jul	$ 28.73	$ 25.64	$ (3.09)	-10.8%
Aug	$ 30.41	$ 27.47	$ (2.94)	-9.7%
Sep	$ 33.30	$ 37.12	$ 3.82	11.5%
Oct	$ 50.36	$ 48.11	$ (2.25)	-4.5%
Nov	$ 86.30	$ 88.44	$ 2.14	2.5%
Dec	$ 135.71	$ 122.45	$ (13.26)	-9.8%

In step two, monthly total Expected Baseline Commodity Margins are calculated by multiplying by the results above by the monthly numbers of customers. The calculation is shown in Tables 43 & 44. Results are shown for the first eight months of the fifteen month 2008 pilot year to illustrate the effect. Depending on the month, the Weather Adjusted Expected Commodity Margin may be larger or smaller than the Non-Weather Adjusted Expected Commodity Margin. The percentage difference by month in the two tables ranges from positive one-tenth of one percent (0.1%) for commercial in April of 2008 to minus twenty-three percent (23%) for residential in May of 2008.

Table 43: Non-Weather Adjusted Residential Expected Commodity Margin.

Washington Residential (Rate 503) Expected Commodity Margins								
Category	Oct-07	Nov-07	Dec-08	Jan-08	Feb-08	Mar-08	Apr-08	May-08
Customers	160,107	161,773	162,682	163,423	163,772	163,878	163,834	163,530
Baseline Commodity Margin/Customer	$11.82	$22.70	$ 32.66	$ 32.14	$ 17.82	$ 18.33	$ 16.10	$ 7.05
Expected Commodity Margin	$1,892,464.74	$3,672,247.10	$ 5,313,194.12	$ 5,252,415.22	$ 2,918,417.04	$ 3,003,883.74	$ 2,637,727.40	$ 1,152,886.50
Non WX Baseline Commodity Margin/Cust	$11.42	$23.56	$ 29.37	$ 33.82	$ 18.42	$ 17.15	$ 16.21	$ 5.43
Non WX Expected Commodity Margin	$1,828,421.94	$3,811,371.88	$ 4,777,970.34	$ 5,526,965.86	$ 3,016,680.24	$ 2,810,507.70	$ 2,655,749.14	$ 887,967.90
Commodity Margin Difference	($64,042.80)	$139,124.78	($535,223.78)	$274,550.64	$98,263.20	($193,376.04)	$18,021.74	($264,918.60)
% Difference	-3.4%	3.8%	-10.1%	5.2%	3.4%	-6.4%	0.7%	-23.0%

Table 44: Non-Weather Adjusted Commercial Expected Commodity Margin.

Washington Commercial (Rate 504) Expected Commodity Margins								
Category	Oct-07	Nov-07	Dec-08	Jan-08	Feb-08	Mar-08	Apr-08	May-08
Customers	22,858	23,039	23,258	23,373	23,509	23,472	23,414	23,337
Baseline Commodity Margin/Customer	$ 50.36	$ 86.30	$ 135.71	$ 131.95	$ 84.72	$ 74.05	$ 62.45	$ 34.28
Weather Adjusted Expected Commodity Margin	$ 1,151,128.88	$ 1,988,265.70	$ 3,156,343.18	$ 3,084,067.35	$ 1,991,682.48	$ 1,738,101.60	$ 1,462,204.30	$ 799,992.36
Non WX Baseline Commodity Margin/Cust	$ 48.11	$ 88.84	$ 122.45	$ 138.21	$ 86.03	$ 69.68	$ 62.49	$ 29.45
Non-Weather Adjusted Expected Commodity Margin	$ 1,099,698.38	$ 2,046,784.76	$ 2,847,942.10	$ 3,230,382.33	$ 2,022,479.27	$ 1,635,528.96	$ 1,463,140.86	$ 687,274.65
Commodity Margin Difference	($51,430.50)	$58,519.06	($308,401.08)	$146,314.98	$30,796.79	($102,572.64)	$936.56	($112,717.71)
% Difference	-4.5%	2.9%	-9.8%	4.7%	1.5%	-5.9%	0.1%	-14.1%

In step three, the conservation difference is calculated (Tables 45 &46). Here, the difference of differences by month ranges from negative sixty-nine and one-tenth percent (-60.1%) for commercial in April 2008 to negative three-hundred forty-three and eight tenths percent (-343.8%) for commercial in May 2008.

Table 45: Residential Rate 503 Conservation Differences.

Washington Residential (Rate 503) Conservation Difference (Non-Weather Adjusted and Weather Adjusted)								
Category	Oct-07	Nov-07	Dec-08	Jan-08	Feb-08	Mar-08	Apr-08	May-08
Non-Weather Adjusted Expected Commodity Margin	$ 1,828,421.94	$ 3,811,371.88	$ 4,777,970.34	$ 5,526,965.86	$ 3,016,680.24	$ 2,810,507.70	$ 2,655,749.14	$ 887,967.90
Actual Commodity Margin	$ 2,232,711.84	$ 4,089,232.62	$ 4,731,992.59	$ 5,253,681.83	$ 3,905,552.00	$ 3,753,934.36	$ 2,644,147.93	$ 1,379,844.50
Non Weather Adjusted Conservation Difference	$ 404,289.90	$ 277,860.74	$ (45,977.75)	$ (273,284.03)	$ 888,871.76	$ 943,426.66	$ (11,601.21)	$ 491,876.60
Weather Adjusted Conservation Difference	$ (263,115.19)	$ (192,995.16)	$ 336,108.63	$ 533,303.80	$ (1,063,207.94)	$ (216,113.21)	$ 569,576.47	$ (223,382.09)
Difference of Differences	$ 667,405.09	$ 470,855.90	$ (382,086.38)	$ (806,587.84)	$ 1,952,079.69	$ 1,159,539.87	$ (581,177.68)	$ 715,258.69
% Difference of Differences	-253.7%	-244.0%	-113.7%	-151.2%	-183.6%	-536.5%	-102.0%	-320.2%

Table 46: Commercial Rate 504 Conservation Differences.

Total Washington Commercial (Rate 504) Conservation Difference (Non-Weather Adjusted and Weather Adjusted)								
Category	Oct-07	Nov-07	Dec-08	Jan-08	Feb-08	Mar-08	Apr-08	May-08
Non-Weather Adjusted Expected Commodity Margin	$ 1,099,698.38	$ 2,046,784.76	$ 2,847,942.10	$ 3,230,382.33	$ 2,022,479.27	$ 1,635,528.96	$ 1,463,140.86	$ 687,274.65
Actual Commodity Margin	$ 1,477,070.19	$ 2,388,010.45	$ 2,817,329.34	$ 3,173,474.21	$ 2,548,857.18	$ 2,256,623.76	$ 1,524,862.27	$ 856,957.07
Non Weather Adjusted Conservation Difference	$ 377,371.81	$ 341,225.69	$ (30,612.76)	$ (56,908.12)	$ 526,377.91	$ 621,094.80	$ 61,721.41	$ 169,682.42
Weather Adjusted Conservation Difference	$ (278,983.18)	$ (322,638.49)	$ 183,993.83	$ 191,887.62	$ (626,085.96)	$ (259,831.63)	$ 200,012.93	$ (69,593.11)
Difference of Differences	$ 656,354.99	$ 663,864.18	$ (214,606.60)	$ (248,795.74)	$ 1,152,463.87	$ 880,926.43	$ (138,291.52)	$ 239,275.53
% Difference of Differences	-235.3%	-205.8%	-116.6%	-129.7%	-184.1%	-339.0%	-69.1%	-343.8%

Finally, in the fourth step the cumulative deferral (the amount in the variance account) is calculated for each month (Table 47). Cumulating the differences makes the cumulative difference by month very large.

Table 47: Calculation of Cumulative Values for Monthly Variance Account.

Overall Difference in Cumulative Deferred Balance, by Month (Rate 503 & Rate 504 Combined)								
Category	Oct-07	Nov-07	Dec-08	Jan-08	Feb-08	Mar-08	Apr-08	May-08
Weather Adjusted Conservation Deferral Balance	$ (542,098.37)	$ (515,633.65)	$ 520,102.46	$ 725,191.42	$ (1,689,293.90)	$ (475,944.83)	$ 769,589.40	$ (292,975.20)
Non-Weather Adjusted Conservation Deferral Balance	$ 781,661.70	$ 619,086.42	$ (76,590.51)	$ (330,192.16)	$ 1,415,249.67	$ 1,564,521.47	$ 50,120.20	$ 661,559.02
Weather Adjusted Cumulative Deferred Balance	$ (542,098.37)	$(1,057,732.02)	$ (537,629.56)	$ 187,561.86	$ (1,501,732.04)	$ (1,977,676.87)	$ (1,208,087.47)	$ (1,501,062.67)
Non-Weather Adjusted Cumulative Deferred Balance	$ 781,661.70	$ 1,400,748.13	$ 1,324,157.61	$ 993,965.46	$ 2,409,215.13	$ 3,973,736.59	$ 4,023,856.79	$ 4,685,415.81
Difference in Cumulative Deferred Balance	$ 1,323,760.08	$ 2,458,480.15	$ 1,861,787.17	$ 806,403.60	$ 3,910,947.16	$ 5,951,413.47	$ 5,231,944.26	$ 6,186,478.48
% Difference	-244.2%	-232.4%	-346.3%	429.9%	-260.4%	-300.9%	-433.1%	-412.1%

Only the first eight months of the pilot are shown to demonstrate the effect, but as is evident in the bottom row of Table 47, the cumulative deferred amounts are very different when weather is not removed from the mechanism in contrast to the actual pilot mechanism (with weather removed). When carried through year end 2008, the actual pilot (with weather removed) showed a negative balance that was refunded to customers. For the actual pilot the amount refunded was $401,328.82 (not including interest). If weather had not been removed, there would have been a much larger negative balance and the refunded amount would have been $5,974,170.44 (not including interest). For 2009, the Company's worksheet calculation shows $112,036.60 in the variance account at year end,[59] a portion of which might have been recovered by the Company based on its conservation performance. The calculation if weather is included yields a variance account amount of negative $4,021,802.33 at year end 2009 which would have been refunded to customers.

In summary, removing weather or leaving weather in the calculations creates very different effect sizes. By removing "noise" from the data, weather adjustment "damps down" calculation results yielding much smaller effects.

[59] There is a discrepancy in that the written report gives the year end variance account at $97,335 (including interest) while the Appendix B spreadsheet back-up attached shows this as $112,036.60 (not including interest). However, this does not affect the calculation contrasts in this sub-section of the examination study which are consistent with Appendix B. Cascade Natural Gas Corporation, Annual Decoupling Mechanism Report, Calendar Year 2009. Cascade Natural Gas, March 31, 2010, P. 3 and Appendix B, P. 3 of 4.

Rate Design

In this sub-section, three alternative imperfect methods to increase effective energy conservation are presented: decoupling with a nested performance incentive, a pure Loss Reduction Adjustment Mechanism (LRAM) and a high fixed customer charge.

(1) **Decoupling with a Nested Performance Incentive.** As indicated by the Company's economic returns during the pilot, the Company has been profitable and did not have a problem with declining (weather adjusted) sales during the pilot. If the pilot mechanism were to be continued, we would recommend:

(a) **Recovery Percentage.** Keeping the decoupling mechanism essentially as it is but changing the recovery percentage for meeting or exceeding the yearly conservation target from 90% to 100%. This is recommended simply as a matter of fairness and as a motivational tool.

(b) **Performance Incentive.** In addition, in those years in which the existing mechanism rejects an award due to the earnings cap established in the previous rate case having been exceeded, one might consider embedding a small performance incentive. The performance incentive would provide some certainty of award proportional to conservation effort while keeping but softening the effect of the earnings cap. The reason for including this modification would be to insure a linearly positive award for level of conservation performance against target. We see no reason to change the application of the weather normalization or the earnings cap, but one could create this exception to insure conservation performance is consistently awarded. The size of this award might not represent complete value; it could represent one-half or one-third. The objective would be to insure a linearly positive award for level of conservation performance against target, though not the full size of the award as when the earnings cap is not exceeded.

(c) **New Customers.** In the operation of the earnings cap, the portion of increased earnings due to new customers might be excluded as a means of further fine-tuning the decoupling mechanism. It is reasonable to not negatively impact the Company for providing service to additional customers who request natural gas service.

(2) **Pure LRAM.** If it is decided to move away from a decoupling mechanism, the Load Reduction Adjustment mechanism is an alternative. We do not recommend this alternative, but it could be considered. Under this type of mechanism, the company is allowed to recover revenues lost as a direct result of energy conservation programs it provides. Unfortunately, LRAM has two significant disadvantages. First, LRAM by itself is a "one-sided" mechanism (in favor of the utility), because it compensates the utility for revenue shortfall due to Company driven energy conservation but allows the Company to retain excess sales revenues if overall sales increase. Second, with LRAM, the utility continues to be in a position where it may regard energy conservation that is driven outside of Company energy conservation programs as having a

negative impact on the company (i.e., because of the reduction in sales volume that they cause). This may have an adverse effect on company cooperation and support of such broader energy conservation efforts.

The LRAM alternative can be seen as a plus in that the award is in proportion to the conservation put into place by the Company but, on the downside, it is not responsive to conservation put into place by other causes or agencies or to other factors that may cause energy use to decline, such as the current economic problems. For example, an improvement in energy codes is not rewarded (unless a specific exception is created that defines a path for the Company to be active in the code process and become rewarded for previous effort when new code is approved). An additional advantage of the LRAM is that it is easy to understand and explain to customers – "The Company produced recurring energy savings in a definite measured amount, so it should be entitled to recover a portion of the revenues that were lost due to that effort."

But the LRAM can also be seen as a minus because in an LRAM in pure form a Company has a disincentive to improve codes, or to support any other type of conservation effort for which they are not directly compensated. Also, in practice the LRAM requires a revenue cap to keep the conservation performance bonus in line with or slightly above (to provide incentive) the regular rate of return (but not much above, so as to appear fair on its face). Otherwise, LRAM compensation amounts have been known to escalate to such high levels that they become very problematic.

On balance, we do not recommend the LRAM. This is in part due to the considerations above but also from the perspective that the decoupling approach is superior because it has the capability to move the focus of the utility organizational culture overall towards serious energy conservation while the LRAM is more like opening another sales window within the sales culture. Also, the LRAM does not have the relative strength of the insurance or hedge effect of the decoupling mechanism.

(3) **Increase the Fixed Charge Portion of the Monthly Bill.** Another approach is to trade a substantially increased fixed charge for Company marketing and promotion of energy conservation information, energy conservation programs and customer incentives. This greatly reduces the volatility of the customer bill, insures stable returns to the Company and in the form of an agreement would increase Company driven energy conservation. However, we do not recommend this approach.

One major problem with this alternative is that it immediately and permanently reduces the "price signal" to customers to encourage conservation. It lowers the value of energy conservation investment for the customer because the "value" of each therm saved is much lower since the only cost savings to the customer from conservation comes from the reduced

volumetric portion of the monthly bill and the volumetric activity is largely transferred to the fixed charge in this approach.

A second problem is the direct effect on low-income and moderate-income households that try to cut back on energy use to save money. If the fixed charge is large, cutting back, even a lot of cutting back, will have a lesser effect on dollar savings. In effect, an increased fixed charge penalizes those who attempt to conserve and rewards those who are wasteful - - because they each pay the same fixed charge regardless of how much they use. We recommend against this approach, but if it were tried, it should require an exemption for low-income and other hardship cases.

For these reasons we recommend decoupling over the alternative of increasing the fixed charge.

Decoupling breaks the link from increased sales to production of increased returns. In contrast the LRAM is a "both and" proposition. Here the utility is rewarded for increased sales and also separately compensated for energy conservation accomplished. However, it is true that with decoupling alone, though the link from increased sales of energy to increasing profit is severed, the agreement to do effective energy conservation is simply an agreement and results have to be demonstrated in practice, as they were in the Cascade pilot.

The decoupling mechanism of the pilot was two-sided. Also, it did not require measurement of conserved energy other than by pre-approved deeming (except for custom projects), thus providing the advantage of avoiding most measurement problems. *But at its heart it is not directly driven by units of energy conservation achieved* except through the separate governor mechanism of percentage award/penalty for conservation performance which is an overlay on the mechanism that determines recoverable margin amount. This same problem of *not being directly driven by units of energy conservation achieved* occurs with the alternative of increasing the fixed charge portion of monthly bill (sometimes also called decoupling, though the mechanism is very different from real decoupling).

In true decoupling, as in the pilot, the conservation performance award/penalty mechanism does potentially come into play to calibrate the result of the revenue margin basis year-end cumulative deferred variance amount. But the primary mechanism underlying the system is not meaningfully related to energy conservation savings in fact, but only in theory. Also, a utility might turn without loss to some degree from the conservation effort implicit in a decoupling agreement while keeping decoupling in place as a hedge. At the same time, the LRAM alternative by itself, though it directly rewards the utility for each unit of energy saved does not discourage an energy sales emphasis alongside the conservation emphasis.

Recommendation 8: An increase in the fixed portion of the bill as an alternative to decoupling is not recommended because it correspondingly diminishes the per-unit "price signal" that customers see regarding their natural gas consumption, and thereby reduces the incentive for pursuing energy conservation. Moreover, shifting costs to the fixed portion of the bill relatively penalizes those who conserve and use little energy, and relatively rewards those who are wasteful. The recommendation is for the current decoupling mechanism to be retained, but to raise the potential award from the conservation governor mechanism to 100%. We further recommend that for years in which the earnings cap would otherwise require a write-off, there should be some performance incentive award linearly related to level of progress in meeting target. Further that energy use of new customers should be removed from the earnings cap assessment. Should it be determined not to restart decoupling, a pure LRAM could be considered, but is overall an inferior approach. Since the decoupling mechanism worked for the pilot, such decoupling should be regarded as a proven effective approach.

Financial Impact

Most financial impact concerns have been presented in pieces in other sections of this study. However, to keep the presentation coherent under this topic they are also presented here.

Effects and Safeguards

One of questions is the role of the earnings cap. In Order 06, the Commission concisely stated the pilot safeguards:[60]

The Commission conditioned implementation of the pilot decoupling program on approval of the Company's Conservation Plan, requiring the Company to include in the Plan an earnings cap based on the authorized overall rate of return of 8.85 percent, an appropriate and verifiable assessment mechanism to provide an effective safeguard against potential over-earning, penalties for failure to meet conservation targets, and requiring the Company to perform an independent evaluation of the pilot program, regardless of whether the Company seeks to continue the program after the three year period expires.

Each year of the pilot, one or more of the safeguards came into play. The earnings cap came into play for calendar 2009 so that the year-end variance amount (including interest) of $97,335 was written off. If the earnings cap had not been exceeded, the Company would have earned ninety percent (90%) of this amount due to is successful energy efficiency effort in that year. For Calendar 2009, the earnings cap for the decoupling mechanism was 8.85%. The Company earned 9.16%. The difference in dollars

[60] UG-060256, Order 06, Order approving conservation and low income weatherization plan, subject to conditions; authorizing and requiring compliance filing; denying Public Counsel's motion for leave to file comments, August 16, 2007, P. 16, §54.

earned between the decoupling mechanism earnings cap and actual earnings was $682,500.[61] This demonstrates the effectiveness of the earnings cap.

For the fifteen month period ending December 2008, another safeguard was operative. The variance account at year-end was negative. Under the terms of the mechanism, a negative balance of $479,310.02, including interest[62] was 100% refunded to customers on the two included rates (residential Rate 503 and commercial Rate 504).

In 2010, the award/penalty mechanism for failure to meet conservation targets was operative. For 2010, the cumulative deferred balance (including interest) was positive so there might have been an award to the Company. With performance at seventy-nine percent (79%) of target[63] the award would have been at a thirty percent (30%) discount from the amount in the variance account (including interest) at year end.[64] However, the earnings cap also applied for 2010. Since the earnings cap was exceeded, the balance in the variance account was written off.

The final safeguard is the independent examination of the pilot (this study).

Conservation Lost Revenue vs. All Lost Margins

There was no general reduction in energy use for either residential Rate 503 or commercial Rate 504 customers during the pilot. The average natural gas use (annual therms/customer) is essentially stable for residential customers. Gross sales increased over the pilot due entirely to addition of residential customers for Rate 503 and due primarily to addition of commercial customers for Rate 504. For the commercial customers there is a slow annual increase in gas energy use per customer plus an increase in gross sales due to gradually year-by-year addition of customers. See Tables 48-50; these tables are identical to Tables 31-33, P. 53. Also see Figures 25 & 26; see discussion Pp. 70-74.

[61] Based on Company response to Data Request No. 8-3.

[62] Cascade Natural Gas Corporation, Deferred Technical Adjustment Summary, 3/20/2009, final column, final row (deferred balance for Dec-08). Ninety percent of this amount is $431,379.02 which is the dollar amount that would have been recovered by the Company if it had been a positive rather than a negative balance.

[63] The Company claims only seventy-eight percent (78%) in its 2010 report. This is probably due to a difference in rounding.

[64] The earnings cap also came into play. The Company's Commission Basis Earnings for the Calendar Year Ending December 31, 2010 was 9.06% against the revenue cap rule which is set from the previous rate case at 8.85%. This would have, in itself, prevented an award under the mechanism.

Table 48: Increased Energy Use (2006 vs. 2008).

Rate	2006	2008	Delta
	(Weather Normalized Therms)		
Residential	100,927,127	151,628,815	50,701,688
Commercial	74,834,227	111,115,324	36,281,097
Total	175,761,354	262,744,139	86,982,785

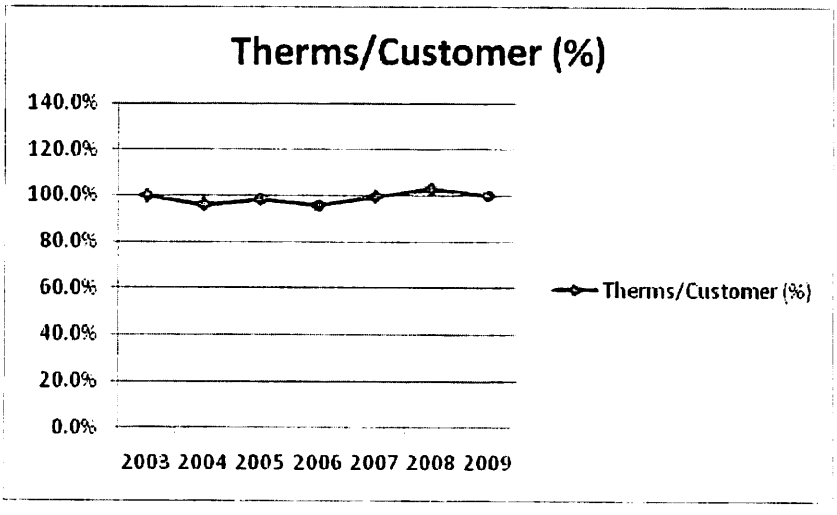
Table 49: Increased Energy Use (2006 vs. 2009).

Rate	2006	2009	Delta
	(Weather Normalized Therms)		
Residential	100,927,127	109,696,042	8,768,915
Commercial	74,834,227	85,364,525	10,530,298
Total	175,761,354	195,060,567	19,299,213

Table 50: Increased Energy Use (2006 vs. 2010)

Rate	Jan-Sep 2006	Jan-Sep 2010	Delta
	(Weather Normalized Therms)		
Residential	63,584,659	70,128,313	6,543,654
Commercial	49,111,007	51,431,471	2,320,464
Total	112,695,666	121,559,784	8,864,118

Figure 25: Therms per Residential (Rate 503) Customer prior to and during Pilot.



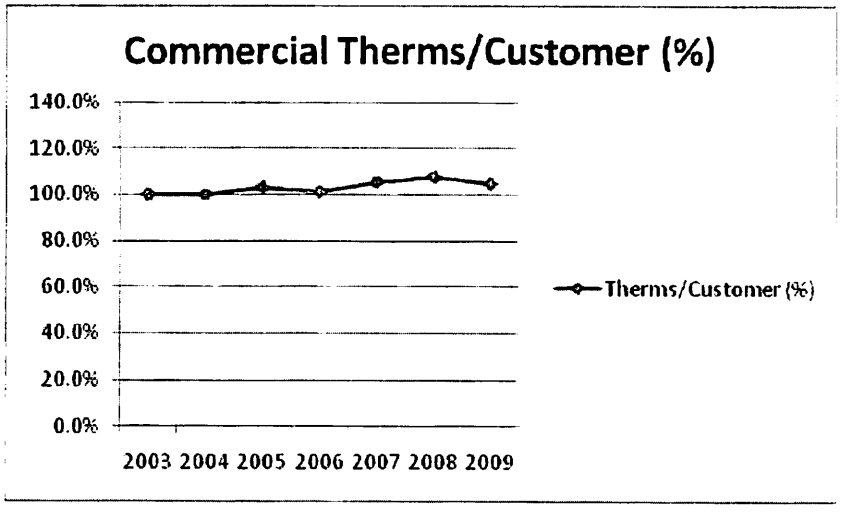


Figure 26: Therms per Commercial (Rate 504) Customer prior to and during Pilot.

The only documentable lost revenue from energy conservation during the pilot is from the therm savings by project participants. Table 51 shows first-year therms saved by participants during the pilot (Table 51 is identical to Table 58, P. 88).

Table 51: Therms saved during Pilot.

Three Year Pilot Achievements			
	Residential & Commercial	Low Income	Total
Therms Saved	1,403,704	59,527	1,463,231
Savings Target	1,342,375	74,875	1,417,250

Rate Adjustments

The only rate adjustments implemented by Cascade during the pilot for the rates included in the pilot (residential Rate 503 and commercial Rate 504) were the one-time refund under the decoupling mechanism for 2008 and a series of purchased gas adjustments (PGAs).[65]

Actual and Relative Impacts

For the fifteen months ending December 2008, the year-end balance in the deferral account was negative, so $479,310.02 was refunded to customers on residential Rate 503 and commercial Rate

[65] Based on response to Data Request No. 1.4.

504[66]. For the twelve months ending December 2009, the amount in the deferral account at year end (including interest) was a positive $97,335.06. The Company would have received ninety percent (90%) of this amount or $87,601.55, but since the earnings cap was exceeded for 2009, this amount was written off.[67] For the nine months ending in October 2009, the amount in the deferral account at the end of October was a positive $958,868.97.[68] The company would have received a discount of 30% from this amount or $671,208.28 but the earnings cap was exceeded for 2010 and the full $958,868.97 was written off. For related detail, see the subsection on Effects on Included Classes (Pp. 17-20).

Surcharge Revenue

Since there was a refund for the first pilot year of fifteen months, and the second pilot year of twelve months and the final pilot year of nine months resulted in write-offs, no decoupling charge was collected during the pilot.

Conservation Revenues

Conservation costs are shown in Table 52 (reprinted from Table 36, P. 55). These costs were collected in revenue. For more detail on this topic, see the subsection on Program Costs and Energy Savings (Pp. 54-56).

Table 52: Conservation Costs.

Total Energy Conservation Costs				
Year	**Residential**	**Commercial**	**Low Income**	**Total**
2008	1,568,447	621,333	194,724	2,384,504
2009	1,934,516	1,046,094	242,765	3,223,375
2010	1,858,949	1,264,087	417,125	3,540,161
Total	5,361,912	2,931,514	854,614	9,148,040

Lost Margins

There were no lost margins prior to decoupling since there was no mechanism in place to develop lost margins. The lost margins resulting from the decoupling mechanism are listed in the subsection on Actual and Relative Impacts (above, Pp. 77-78).

[66] Cascade Natural Gas Corporation, Deferred Technical Adjustment Summary, 3/20/2009, final column, final row (deferred balance for Dec-08). Ninety percent of this amount is $431,379.02 which is the dollar amount that would have been recovered by the Company if it had been a positive rather than a negative balance.

[67] Cascade Natural Gas Annual Decoupling Mechanism Report for Calendar Year 2009 (Docket UG-060256), Deferred Technical Adjustment Summary, "Deferred Balance" column, for December 09.

[68] Cascade Natural Gas Corporation Annual Decoupling Mechanism Report Calendar Year 2010, March 31, 2011. See the final line in the final row of the final table, "Cascade Natural Gas Corporation, Conservation Alliance Plan Using Cascade HDD Coefficients with No Annual CAP Update, Deferred Accounting Details – Twelve Months Ended December 31, 2010."

Alternative Deferred Revenue and Lost Margin Recovery

As discussed above in the other subsections of this section of the study, lost margins were not recovered during the pilot. The 2008 year ended with a refund to customers. Years 2009 and 2010 resulted in write-offs. Detail concerning the earnings test and the conservation mechanism is presented in the subsection on Effects and Safeguards (Pp. 74-75) and in the subsection on Effects on Included Classes (Pp. 17-20).

Customer Impact

This section of the study includes factors in usage reduction, service quality, customers and usage, effect on the typical customer and allocation to customer classes, incentive and behavior, and effect on the billing system.

Factors in Usage Reduction

There are not enough years of data in the pilot to run reasonable regressions on usage reduction. And, of course, gross sales are increasing in both the residential (Rate 503) and commercial sectors (Rate 504). In an earlier section of this study, it was shown that the average use of natural gas per household is essential stable while for the commercial sector there is a slight tendency for increased use of gas per firm. Also, it was shown that the primary driver of gas sales is the number of households and number of firms connected.

As noted earlier this pattern suggests that natural gas homes are free of the Jevons Paradox/Rebound direct effect and commercial use of natural gas is largely free of the direct effect at least in the short run so that usage reduction will tend to be permanent in the residential sector and erode very slowly in the commercial sector. There will, of course, be an indirect effect since customer savings in one area (natural gas bills) will tend to be reflected in customer spending in other areas (for example, food or transportation) and result in increased energy use in those areas.

Using data for the State of Washington, the following relations were calculated. Figure 27 confirms the result that what drives overall gas sales in Washington is almost entirely the increase in population (which in turn would be reflected in an increasing number of gas heated households and commercial firms using natural gas). As shown in the figure, the slope of the curve is positive. The value of the adjusted R-squared for this relationship is 0.96, an extremely large effect size, meaning that ninety-six percent of the variation in gas sales is accounted for by increase in population.[69] In testing other possible influences on gross sales, the relation between price of gas and gross sales has an adjusted R-squared of approximately zero, meaning that within the forty-one years analyzed variations in price of gas have not influenced the sales trend. There were, of course, temporary changes in certain years but these did not overcome the trend. In part, this may be because the variation in price of gas in constant dollars has varied over a very restricted range. However, value of gross sales is negatively influenced by

[69] Gas sales in billions of cubic feet from Energy Information Administration SEDS System; Population from Washington State Office of Financial Management. Thirty-one annual values from 1980 through 2010 were used in the analysis.

the size of yearly increases in the Consumer Price Index. The value of adjusted R-squared for this relationship is 0.35, a strong effect size, meaning that in years in which there is a rapid increase in inflation there has been a decrease in the use of natural gas. Putting these two relationships together, natural gas use has shown reductions in years of rapid general inflation but historically the price of natural gas by itself has not shown an influence on the trend in use.[70]

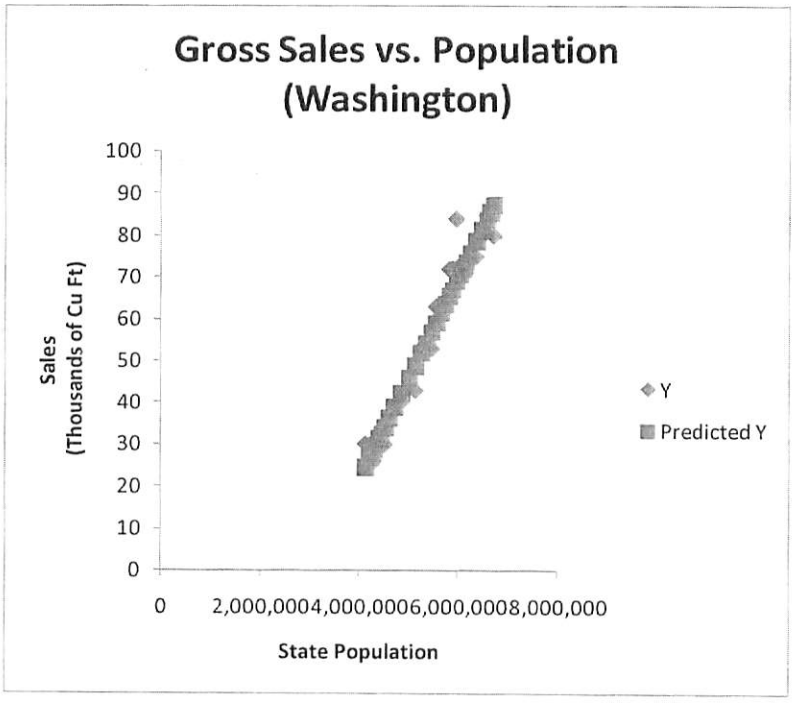


Figure 27: Gross Sales vs. Population for State of Washington.

Switching to use of natural gas per capita as the dependent variable, the adjusted R-squared for price is essentially zero and the adjusted R-squared for unemployment is essentially zero. However, the adjusted R-squared using annual changes in the CPI as the independent variable has a R-squared of 0.24, a medium effect size indicating that per capita gas use is negatively affected by sudden increments in

[70] Gas sales in billions of cubic feet and price data are from the EIA SEDS System for State of Washington. Forty-one annual values from 1970 through 2010 were used in the analysis of gross sales and gas price. CPI data is from the Bureau of Labor Statistics (CPI-U). Forty years of annual data from 1971 through 2010 were used in the analysis of gross sales and CPI.

inflation in the general economy. It has not historically been the gas price itself, but rather sudden increases in general inflation that decreases natural gas use.[71]

Service Quality

As shown in Table 53, both residential and commercial customers (participants and non-participants) overwhelmingly report that service quality has not changed since the beginning of decoupling (2007). Of the customers who report a change in service quality, more report feeling quality is better than in the past rather than report that service quality is not as good.

Table 53: Quality of Service.

Since 2007, would you say the Quality of Service from Cascade Natural Gas is better, not as good or about the same as it was in the past?				
	Residential		Commercial	
	Participants (n=48)	Non-Participants (n=49)	Participants (n=50)	Non-Participants (n=43)
Better	14.6%	10.6%	6.0%	4.7%
Same	81.3%	85.1%	92.0%	95.3%
Not as Good	4.2%	4.3%	2.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%

Table 54: Satisfaction with Service.

How Satisfied are you with the Service you receive from Cascade Natural Gas?				
	Residential		Commercial	
	Participants (n=49)	Non-Participants (n=49)	Participants (n=50)	Non-Participants (n=47)
Very Satisfied	75.5%	59.2%	52.0%	53.2%
Somewhat Satisfied	14.3%	20.4%	34.0%	29.8%
Neither	8.2%	14.3%	12.0%	17.0%
Somewhat Dissatisfied	2.0%	2.0%	2.0%	0.0%
Very Dissatisfied	0.0%	4.1%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%

[71] Gas sales in thousands of cubic feet per capita and price data are from the EIA SEDS System for the State of Washington. CPI data is from the Bureau of Labor Statistics (CPI-U). Unemployment data is from the Bureau of Labor Statistics. Thirty-one years of annual data from 1980 through 2010 were used in the CPI analysis and in the price analysis. Twenty-one years of annual data from 1990 through 2010 in the unemployment analysis.

A majority of customers, both commercial and residential and both participants and non-participants, report being very satisfied with the service received from Cascade Natural Gas (Table 54, first row). If the responses to the two "satisfied" responses are added together, the results are nearly ninety percent (90%) for residential participants, nearly eighty percent (80%) for residential non-participants, eighty-six percent (86%) for commercial participants and eighty-three percent (83%) for commercial non-participants. The differences in satisfaction among these customer groups are offset by responses in the "neither satisfied nor dissatisfied" responses. Those customers who are somewhat or very dissatisfied are the smallest within each customer group and constitute essentially a residual.

Customers and Usage

According to the Energy Information Administration, "The increase of residential natural gas consumption correlates well with population growth over time."[72] This is the case with CNG's provision of service to Washington households (Rate 503). Figure 28 shows the relative increase in the number of Washington households served by Cascade from 2003 through 2010, an increase of twenty percent (20%). Figure 29 shows the relative increase in total therms delivered to Washington households from 2003 through 2010 also is an increase of twenty percent (20%). Figure 30 indicates that the relative change in annual therms/household is essentially a flat curve (picture a trend line fit to the curve shown) with 2003 therms/household (709.6 therms) essentially the same as 2009 therms/household (707.7 therms). For any practical purpose, therms/household has not changed but the number of households served has increased by twenty percent (20%) causing as twenty-percent (20%) increase in the annual residential sector total of therms delivered.

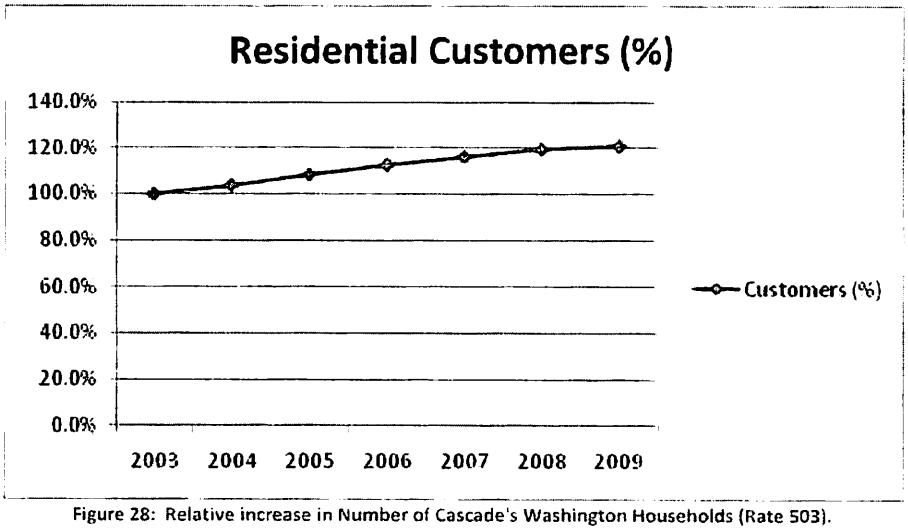


Figure 28: Relative increase in Number of Cascade's Washington Households (Rate 503).

[72] Source: DOE Energy Information Administration (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS database). Note that 2005 is the latest year for which state-by-state data are available from EIA.

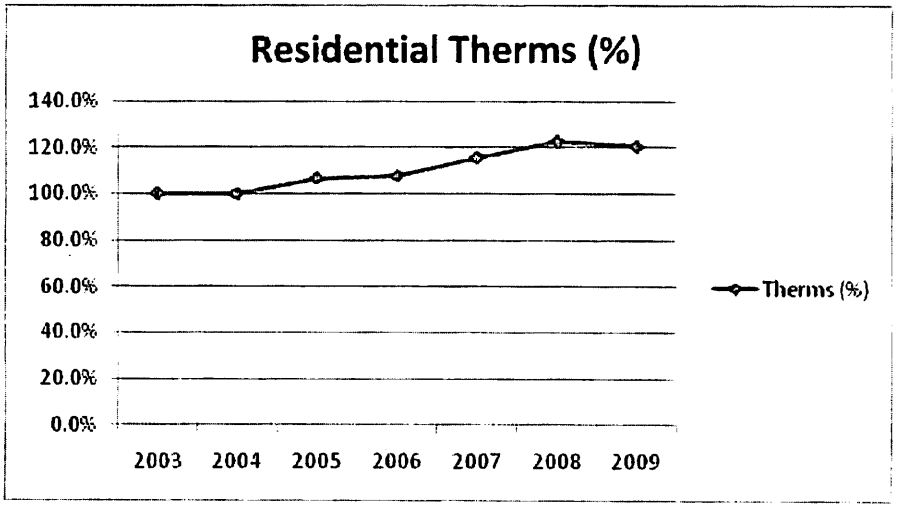


Figure 29: Relative increase in Residential (Rate 503) Therms Delivered.

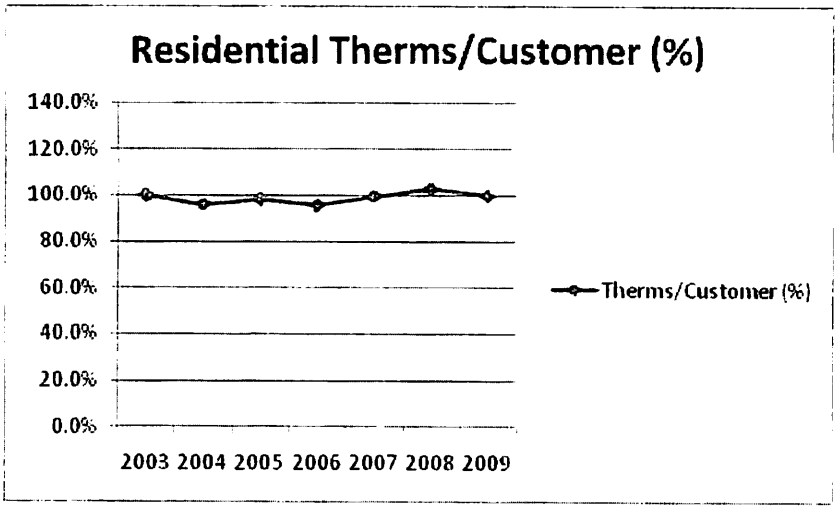


Figure 30: Relative change in Therms/Customer delivered (Rate 503).

For commercial customers (Rate 504), the overall result is quite similar but there is also a small increase in therms per customers relative to 2003. The relative increase in number of customers on Commercial Rate 504 is shown in Figure 31. The number of commercial customers in 2009 was about twelve percent

(12%) more than the number in 2003. Therms delivered were about eighteen percent (18%) higher in 2009 than in 2003 (Figure 32). The relative change in therms/customer is shown in Figure 33. While the average commercial customer used about 3,379 therms in 2003, the average was about 3,543 in 2009, an increase of about five percent (5%). A trend line fit to this curve would have a very slight rise over time. This means that the annual total of therms delivered to the commercial sector is driven by the increase in the number of firms served (12% since 2003) and by the increase in usage per customer (5% since 2003). Together, these factors contribute to the increase in total therms delivered (18% since 2003).

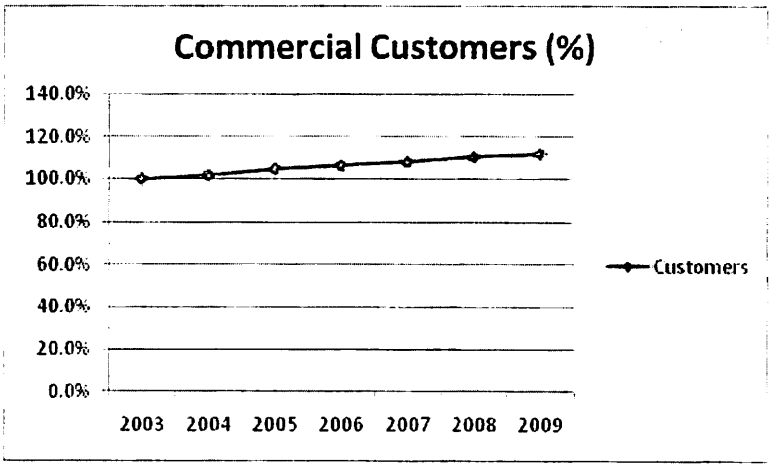


Figure 31: Relative increase in Percentage of Commercial Customers (Rate 504).

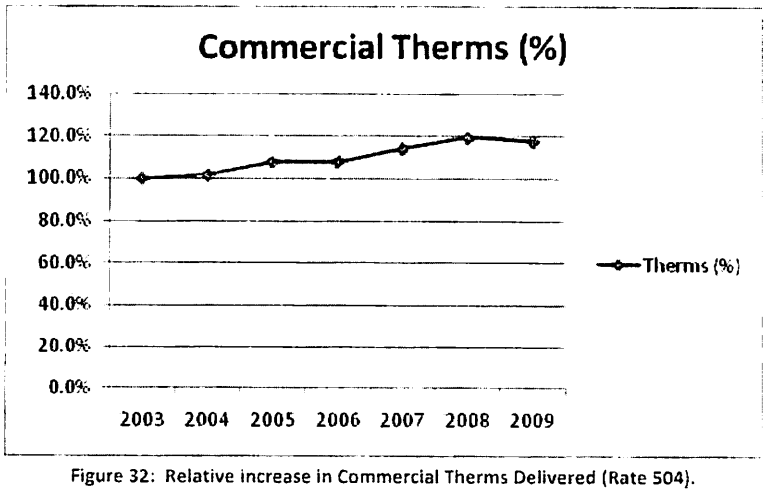


Figure 32: Relative increase in Commercial Therms Delivered (Rate 504).

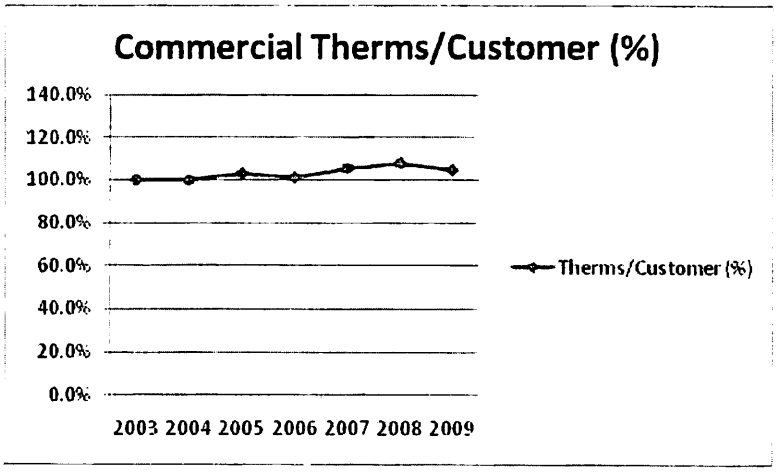


Figure 33: Relative change in Commercial Therms/Customer (Rate 504).

It would not be reasonable to attribute any *overall* difference in annual therms delivered to the program since seventy percent (70%) of non-participant residential customers responding to the survey said they were not aware of the conservation incentives and seventy-eight percent (78%) of commercial non-participants said they were not aware of the program. Also, since the program is relatively new, for both residential and commercial customers only small percentages have participated.

Data analyzed for this section of the report is from Data Request 1.4

Effect on Typical Customer and Allocation to Customer Classes

During the pilot the only bill impacts on customers from the decoupling mechanism came from the rate credit associated with the fifteen month 2008 decoupling margin refund ($0.00233 per therm). This rate credit was applied to residential Rate 503 and commercial Rate 504 customers. This refund affected both participants and non-participants equally.

The bill effect for different levels of energy use is illustrated in Table 55.[73]

Table 55: Illustration of Refund Bill Effect.

Therms per Year & Year's Refund From 2008 Decoupling Adjustment							
Therms	300	660	710	1200	1800	3295	3550
Actual Refund	$0.52	$1.14	$1.22	$2.07	$3.10	$5.68	$6.12

[73] Table 55 is identical to Table 12, P. 18. See discussion there.

In addition, there are temporary rate increments associated with conservation program costs. These temporary rate increments increase as the program is ramped (Table 56)[74]:

Table 56: Temporary Rate Increments for Conservation Program Costs.

Temporary Rate increments for Conservation Program Costs	
November 2005 through October 2007	$0.00155/therm
November 2007 through October 2008	$0.00160/therm
November 2008 through October 2009	$0.00257/therm
November 2010 and forward	$0.02477/therm

These temporary rate increments for conservation program costs are charged to all core rate schedules (Rates 502, 503, 504, 505, 570 and 571). These are the schedules eligible for conservation services. Representative bill impacts, depending on therms used are shown in Table 57.[75]

Table 57: Bill Adder for Conservation Cost.

Annual Impact
of Temporary Rate Increments Associated with Conservation Costs
by Annual Number of Therms Used

Dates	Therms						
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
	300	660	710	1800	2400	3295	4500
11/07-10/07	$0.47	$1.02	$1.10	$2.79	$3.72	$5.11	$6.98
11/07-10/08	$0.48	$1.06	$1.14	$2.88	$3.84	$5.27	$7.20
11/08-11/10	$0.77	$1.70	$1.82	$4.63	$6.17	$8.47	$11.57
11/10 ->	$7.43	$16.35	$17.59	$44.59	$59.45	$81.62	$111.47

Note: The average Rate 503 residential customer is represented by 660 or 710 therms (Cols. 2 & 3); the average Rate 504 commericial customer by 3,295 therms (Col. 6).

[74] Table 56 is identical to Table 37, P. 55. For more detail, please see discussion there.

[75] Table 57 is identical to Table 38, P. 56. For more detail, please see discussion there.

Incentive and Behavior

The decoupling mechanism itself did not directly influence any change in customer behavior or create or maintain a customer incentive for the efficient use of gas during the pilot. As shown in the subsection above, the direct impact of the decoupling mechanism was only experienced by customers in the small refund for 2008.

However, the conservation program bundled with the decoupling mechanism had a small bill impact during the pilot (see subsection immediately above) and had a direct influence on participants. This can be illustrated qualitatively by survey comments such as "I was going to get a less expensive furnace, but with the program I was able to get a better furnace;" "It encouraged me into buying energy efficient appliances;" "The company that insulated our house did a good job". Cascade's program rebate can help facilitate the more expensive energy efficient choice and quality will be high.

At the same time, a little over twenty percent (20.5%) of residential participants surveyed and thirty-eight percent (38%) of commercial customers surveyed said that the rebate was not important in making it possible to make an energy efficient choice. Also, about forty-one percent (41%) of residential non-participants and eight percent (8%) of commercial non-participants surveyed said they had taken some action in the last two years to improve their natural gas energy efficiency (independent of the program). In addition, seventy percent (70%) of non-participant residential customers responding to the survey said they were not aware of the conservation incentives and seventy-eight percent (78%) of commercial non-participants said they were not aware of the program.

On balance, it seem reasonable to concluded that while the decoupling mechanism had no effect on customer conservation during the pilot, the conservation program coupled with the decoupling mechanism had a positive direct effect on most program participants. The marketing and promotional communications campaign also conveys a conservation message which some customers may respond to without remembering the source.

Billing System

Cascade's billing system accommodated transparently to decoupling. Both the conservation cost and the refund for 2008 annual decoupling had small bill effects. It was not necessary to redesign the format of customer bills to accommodate the decoupling pilot.

Low-Income Impact

There are several ways of gauging low-income impact, including the low income proportion of program effort, review of progressive changes in the low-income program, and analysis of need.

Low-Income Proportion

Table 58 shows the summary of pilot achievements from the March 2011 Cascade Natural Gas Annual Decoupling Report for Calendar Year 2010.[76] In the table the residential and commercial sectors saved almost ninety-six percent (96%) of first year therms across the three years of the pilot and the low income sector saved about four percent (4%) of first year therms.

Also, based on this table, the combined residential and commercial sectors met about one-hundred and five percent (105%) of their overall pilot savings target and the low-income sector met about seventy-nine and one-half percent (79.5%) of the separate overall pilot low-income target.

Table 58: Pilot Achievements.

Three Year Pilot Achievements			
	Residential & Commercial	Low Income	Total
Therms Saved	1,403,704	59,527	1,463,231
Savings Target	1,342,375	74,875	1,417,250

First Year Therms Saved. A more detailed analysis of the relative proportion of first year therms savings is developed in Tables 59 & 60. Low-income results are shown in Column 3 of each table. Table 59 shows actual first year therm savings throughout the pilot. Table 60 shows these savings as proportions of the total energy savings for the pilot. Note that the savings proportion for low-income increased from one percent (1.0%) in 2008 and 2009 to a little over two percent (2.1%) in 2010.

Table 59: Pilot First Year Therms Saved.

Therms				
Year	Residential	Commercial	Low Income	Total
	(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)
2008	248,658	191,837	13,985	454,480
2009	273,833	275,604	14,733	564,170
2010	189,415	224,357	30,809	444,581
Total	711,906	691,798	59,527	1,463,231

[76] Cascade Natural Gas Annual Decoupling Report Calendar Year 2010, March 2011, Table E, Three Year Pilot Achievements, P.4.

Table 60: Proportions of Pilot First Year Therms Saved.

Therms				
Year	Residential (Col. 1)	Commercial (Col. 2)	Low Income (Col. 3)	Total (Col. 4)
2008	17.0%	13.1%	1.0%	31.1%
2009	18.7%	18.8%	1.0%	38.6%
2010	12.9%	15.3%	2.1%	30.4%
Total	48.7%	47.3%	4.1%	100.0%

Customers Served. Tables 61 & 62 provide results for number and proportion of customers served using the same formats. Looking at Column 3 for each table, actual customers served are shown in Table 61 and proportions of overall customers served during the three-year pilot are shown in Table 62. Using customers as an indicator of low-income proportions, low-income customers were three-tenths of one percent (0.3%) of overall customers served in 2008, four-tenths of one percent (0.04%) in 2009, and jumped to eight-tenths of one percent (0.8%) in 2010.

Table 61: Customers Served during Pilot.

Customers				
Year	Residential (Col. 1)	Commercial (Col. 2)	Low Income (Col. 3)	Total (Col. 4)
2008	5,869	44	43	5,959
2009	5,678	126	54	5,858
2010	2,333	90	112	2,535
Total	13,880	260	212	14,352

Table 62: Proportions of Customers over the Pilot.

Customers				
Year	Residential (Col. 1)	Commercial (Col. 2)	Low Income (Col. 3)	Total (Col. 4)
2008	40.9%	0.3%	0.3%	41.5%
2009	39.6%	0.9%	0.4%	40.8%
2010	16.3%	0.6%	0.8%	17.7%
Total	96.7%	1.8%	1.5%	100.0%

Programmatic Costs. Tables 63 & 64 show the pilot's programmatic costs and proportions of full pilot programmatic costs. Programmatic costs are all costs for the program except direct incentives. Looking at Column 3, the actual programmatic costs are shown in Table 63 and programmatic costs as proportions of the total programmatic cost of the three-year pilot are shown in Table 64. Note that programmatic cost is decreasing over the pilot years.

Table 63: Full Pilot Programmatic Costs.

Programmatic Costs				
Year	Residential	Commercial	Low Income	Total
	(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)
2008	$964,966	$403,663	$97,362	$1,465,991
2009	$1,108,104	$598,196	$74,387	$1,780,687
2010	$1,319,100	$806,541	$63,984	$2,189,625
Total	$3,392,170	$1,808,400	$235,733	$5,436,303

Table 64: Proportions of Full Pilot Programmatic Costs.

Programmatic Costs				
Year	Residential	Commercial	Low Income	Total
	(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)
2008	17.8%	7.4%	1.8%	27.0%
2009	20.4%	11.0%	1.4%	32.8%
2010	24.3%	14.8%	1.2%	40.3%
Total	62.4%	33.3%	4.3%	100.0%

Incentives Paid. Another way to view the low-income proportion is through the energy efficiency incentives provided by the programs. Tables 65 & 66 show the actual incentives and the proportions of total incentive paid over the three-year pilot. As shown in Column 3 of each table, the amount and proportion of incentives for low-income customers is increasing (from $95,344 or 2.6% in 2008 to $353,141 or 9.5% in 2010).

Table 65: Incentives Paid during the Pilot.

Incentives Paid				
Year	Residential	Commercial	Low Income	Total
	(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)
2008	$603,481	$217,671	$95,344	$916,496
2009	$826,412	$447,898	$168,378	$1,442,688
2010	$539,849	$457,546	$353,141	$1,350,536
Total	$1,969,742	$1,123,115	$616,863	$3,709,720

Table 66: Proportions of Incentives Paid during the Pilot.

Incentives Paid				
Year	Residential	Commercial	Low Income	Total
	(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)
2008	16.3%	5.9%	2.6%	24.7%
2009	22.3%	12.1%	4.5%	38.9%
2010	14.6%	12.3%	9.5%	36.4%
Total	53.1%	30.3%	16.6%	100.0%

While overall proportions for the low-income effort are small, the pattern developed in these tables indicates increasing engagement and lowering of programmatic costs. The increase in customers served and the increase in first-year therms saved demonstrates this progression. The increase in incentives paid correlates with increasing engagement and also with realities of natural gas low-income energy-efficiency programs (as discussed in the subsection on Program Changes, below).

Outreach and Education

Outreach and education for low income customers occurs through the Community Action Agencies (CAAs) and is part of their normal function. CAAs not only focus on a "whole house" approach in weatherization, but also have a "whole family" approach in providing social services. They are generally capable of providing directly or by referral a full range of family services.

By using the CAAs as delivery agents for the low income program, Cascade becomes a participating part of this information and services network and leverages from others' investments in the network. This advantage increased over time during the pilot as improving relations with CAAs were developed, and the current relationship with the CAAs is much better than prior to the pilot. There is no isolable cost to Cascade associated with this outreach and education. Also, Cascade does not claim any direct energy savings from this activity.

In addition, Cascade includes the low income program in its general marketing, promotional and communication efforts. For example there is well written low income descriptive and contact information provided on the Cascade's website.

Program Changes

The low income program and Cascade's general energy-efficiency effort have been evolving since the beginning of the pilot. In the low-income sector, from the beginning, the measures funded have been "major measures," important from an energy savings perspective: attic/ceiling insulation, floor insulation, wall insulation, duct insulation and air infiltration reduction. In 2009 the number of homes served was increased by about 20% over 2008. However, an unanticipated problem was encountered in that the Washington State weatherization sub-grantees (state funded Community Action Agencies) were given direction to serve more homes in order to meet federal/state goals. According to the 2009 Annual Decoupling Report, the agencies adjusted to this mandate by performing less work per home ("a smaller spread of measures over a wider breadth of households"). This resulted in service to a higher number of Cascade Natural Gas Company households than had been anticipated, but a lower first year therm savings than planned. In 2008, Cascade's participating low-income homes saved 325 first-year therms per household, but in 2009 the result was 243 first-year therms per household.[77] For 2010, Cascade reported that the Low-Income program was steadily gaining traction and was becoming recognized by the local Community Action Agencies as a viable source of leveraged funds to serve low-income gas customers. The Company attributes the growing number of low-income customers served to increasingly strengthened relations between the Company and the Community Action Agencies that deliver the low-income program, and greater awareness of the availability of Cascade rebate funds. The Company notes that American Recovery and Reinvestment Act (ARRA) funds have been of assistance in allowing the agencies to serve more CNGC households. The Company also reports that it "...is now working at the state and agency level to better understand any remaining obstacles to the use of Company dollars, and to encourage *all* agencies within CNGC's service territory to participate in the low-income program."[78]

The Company's appointments of Allison Spector as Conservation Manager and Jim Abrahamson as Senior Conservation Analyst in 2009 significantly strengthen the credibility and actual operations of the conservation and low-income efforts.

[77] Information from Cascade Natural Gas Corporation, Annual Decoupling Mechanism Report, Calendar Year 2009, March 2010, P. 2. Note that both savings amounts are sizable and meaningful to the customer and to the Company in terms of both energy savings and dollar savings. The lower figure (243 first year therms) exceeds the result demonstrated in the 2001 Oak Ridge National Laboratory evaluation of the Washington low income Weatherization Assistance Program and represents reduction by thirty-eight to thirty-five percent (38% - 35%) of natural gas energy use in the home based on an average annual use of 660 to 710 therms. Schweitzer, Marty & Linda Berry, *Evaluation of the Washington State Weatherization Assistance Program*. Oak Ridge, Tennessee: Oak Ridge National Laboratory, ORNL/CON-478, March 2001, P. iv.

[78] Cascade Natural Gas Corporation, Annual Decoupling Mechanism Report, Calendar Year 2010, March 2011, P. 3

The Company also adopted the most efficient and effective approach to low-income weatherization in the decision to work through the Community Action Agencies (CAAs) already responsible for implementing low income weatherization programs within its service territory. These agencies face enormous need for service with limited and erratic federal/state funding. Federal appropriations are made yearly, and have changed in amount from year to year. Given their federal/state funding the CAAs can weatherize a limited number of homes each year and will never even begin to seriously catch up with the level of need.[79]

To appreciate the type of problem that Cascade is negotiating in steadily improving its low-income effort, it is useful as a thought experiment to look at the problem of funding from the perspective the Weatherization Director of a Community Action Agency (CAA). Each year, the CAA must project its level of activity (and employment of weatherization staff) in terms of number of weatherization jobs of different types (single family homes, apartments, manufactured or mobile homes; natural gas and electrically heated homes, as well as homes with other sources of home heating). The CAAs operate under directives to prioritize more vulnerable households (homes with children under the age of six, homes with at least one senior citizen, homes in which at least one person is disabled, and the like) while also prioritizing homes with higher than usual energy use. These directives usually indicate different sets of homes with only some overlap. But the core problem in projecting activity for the year is that CAAs do not have independent cash reserves and their funding comes from different sources with different rules and different payment cycles.

The funding agencies for CAAs have different fiscal years. The core of federal weatherization from the United States Department of Energy plus Low Income Home Energy Assistance Program (LIHEAP) funding and LIHEAP leveraging funds from the United States Department of Health and Human Services (leveraging funds are increased by the federal government in part due to Cascade's low-income effort) follow the federal fiscal year (October 1 through September 30th). But these three funding sources have somewhat different rules and timing requirements and the amount of federal dollars available is unknown until Congress appropriates it each year.[80] If state funding is applied it is likely to follow the state fiscal year (July 1 through June 30th). Then, Cascade's support will be organized based on the calendar year. If the electric utilities that cross Cascade's service territory also support low-income weatherization through the CAA's, they may provide support based on their individual fiscal years.

The traditional (legacy) natural gas low-income programs (prior to the pilot) were limited by the lower cost of gas compared with the cost of electricity. Since the cost of gas was less, the amount of funding

[79] Utility coordination with the federal/state Weatherization Assistance Program effort is referred to as the "coordinated program" model. Coordinating utility and public program low-income weatherization program efforts can provide the most cost-effective low-income weatherization programs. Hill, Lawrence J. & Marilyn A. Brown, "Estimating the Cost Effectiveness of Coordinated DSM Programs." *Evaluation Review*, Vol. 19, No. 2, April 1995, Pp. 181-196.

[80] It is not unusual for the appropriation to occur long after it should be available based on local needs.

provided by a natural gas company for an equivalent set of measures installed in a gas heated home was less that that provided by the electric company for an electrically heated home.

What this means to the CAA on a practical basis is that it is *financially much less complicated* for the CAA to weatherize an electrically heated home than to weatherize a home with gas heat. For the legacy programs, the electric company pays all or virtually all of the costs to weatherize an electrically heated home and normally the full cost of each measure installed. But each home with gas heat has historically required a lower payment for equivalent measures. Engaging a home with gas service for weatherization requires a higher expenditure on health and safety to do the combustion tests plus arranging for availability of scarce federal funds to cover all of the measure differences in cost that the gas incentive amount does not fully pay.

It sounds like a simple problem, but with each funding source accompanied by its own rules and disappearing if not used within a set time allocation and triggered by different fiscal years, a situation can exist in which the CAA may need to prioritize spending of federal/state and electric dollars while gas dollars for home weatherization remain unused. Some of the CAA's in Cascade's service territory had difficult experiences with expending gas dollars for home weatherization in the past, so it has taken significant outreach by Cascade to encourage all agencies in Cascade's service territory to take full advantage of the new low-income program. The increase in customers served during the third year of the pilot (2010) at a reduced cost indicates some success in working through these problems. Temporary ARRA funding may also have been a major help.

In general, a major strength of CAA weatherization work is that it comes with fully developed standards, training, and certification with oversight by a state agency responsible for low-income weatherization in Washington. In addition, CAA work is governed by strong safety standards, for example, requiring combustion tests for any home with a natural gas appliance. But the strongest advantage in coordinating Cascade's low-income work through the CAA's is their traditional "house as a system" or "whole house" emphasis, particularly for single family homes and manufactured/mobile homes. It is unfortunate if for a year this emphasis was somewhat diluted to meet temporary service goals in terms of number served instead of completeness of jobs, but the whole house emphasis is a core part of CAA weatherization, embedded in manuals, training, standards, and years of practice so it can be expected to be reasserted.

All in all, Cascade's low-income program has been small but is increasingly successful.

Finding 15: Cascade has progressively improved its understanding and relationship with the Community Action Agencies that deliver low-income weatherization within its service territory. However, natural gas energy efficiency programs are disadvantaged relative to electric low-income programs in that the CAAs have to put at risk of timing and often unknown availability of funds from other sources in order to fully weatherize a gas heated home. The disparity with electric low-income weatherization (which generally does not present this complex problem) to the CAAs puts gas customers at a disadvantage and may result in natural gas program low-income funds being much harder for the agencies to use.

At the end of the pilot it became clear that the price of gas is declining. This will necessarily lead to new Total Resource Cost (TRC) calculations for all measures including those adopted for the low-income program. The TRC test was adopted by most commissions in the 1980s as the primary test for energy efficiency measures, programs and portfolios. It was first adopted for electric utilities and then extended to natural gas utilities. In that now long past era, the test was viewed as progressive because for the first time the test, within the framework of Integrated Least Cost Planning, provided a tool by means of which conserved energy could be placed on the same basis as purchased energy. However, today many commissions have modified the TRC test by tweaking it in one or more of several ways.

Also, we now have the precedent of a major federal program (American Recovery and Reinvestment Act Weatherization Assistance Program) that moved away from a TRC test to a simple *non-discounted* BTU per dollar test. A non-discounted test makes sense for low-income programs because a low-income home today will likely be a low-income home for as long as it lasts. Physically, the need in a low-income program is not the financial situation of considering alternative investments and discounting future dollars but a physical situation of doing the best weatherization work in a portion of housing stock in which need, each and every year, will not in reality diminish by discounting the future. And homes last much longer than financial discounting would imply. For example, in older parts of the US it is not unusual for brick homes lived in during the American Revolution to be broken up into low-income apartments today. The TRC test should still be run, but emphasis should be placed on a BTU/dollar test for low-income to correctly value improvements to a home in the era of climate change. It is essential that low-income families have homes that will operate well through the duration of long climate emergency and the CAAs already have a federal emergency responsibility that parallels their responsibility for home weatherization so moving to a BTU/dollar test for the duration of the climate emergency is a good fit.

It is also possible to move low-income and non-low-income energy efficiency to the Administrator's Cost Test to create more flexibility, as has been done by the Michigan Commission. Wisconsin recently modified its TRC test to use social discounting (set at 2%) rather than the utility discount rate to create flexibility for all of its energy efficiency programs. Other tweaks to the TRC test are possible. In the resource acquisition framework developed in the late 1970's through the 1980s by Amory Lovins and other pioneers of early Integrated Resource Planning (IRP), the basic proposition is that it is often less expensive to conserve a unit of energy at the point of application than it is to purchase it and move it to the point of application.[81]

The market transformation framework later originated independently in Canada and in Sweden, then was copied generally and adapted in the US and the EU. It has earlier roots in social science, marketing, and materials procurement; in particular, US defense procurement. Market transformation required a reinterpretation of the TRC test in that cost will exceed the alternative of gas purchase in certain stages

[81] For the linear programming methods underlying this approach, see Morse, William L. & H. Gil Peach, "Control Concepts in Conservation Supply," *Energy*, Vol. 14, No. 11, Pp. 727-735, 1989.

of market transformation, but will be made up in extremely low cost per unit when pre market transformation costs per unit are averaged with post market transformation cost per unit.

For some time now, both the needs of the low-income sector and climate change are critically real reasons to consider switching the primary test to the BTU/dollar test or to consider one or more changes to the TRC, which is currently proliferating into a variety of different operational tests with the same name in different jurisdictions.[82] For both the low-income sector and for reasons of climate change we need to get housing with deep savings on the map in our region.

Recommendation 9: Cascade should explore the possibilities of modifications to the cost test for low-income programs. Consider requesting commission approval to use the ARRA weatherization cost test (undiscounted BTU/dollar) as the preferred test for low-income programs (in place of the Total Resource Cost test. As a second (lower ranked) alternative see if the Commission will consider a modification of the current Total Resource Cost test to substitute a social discount rate (Wisconsin uses 2%) for the current utility effective discount rate in order to make program funding per measure fully cover measure cost. There are many ways to keep but tweak the Total Resource Cost test for the low-income sector. A reasonable goal is to provide funding to the CAAs for the *full cost* of either gas weatherization jobs as a first goal, or of each individual measure of a set as a lower ranked goal (such as replacement gas furnaces and replacement gas water heaters).

Needs Analysis

An indicator is required in order to develop a practical understanding of need. An indicator should be free of distortion and the characteristics of good quantification are (1) the measurement must be an operationally definable process, (2) the outcomes of the process must be reproducible (reliable or precise), and (3) the process must yield true measurements (be a valid and accurate representation of the thing itself).[83] For example, we might use households with one employed person at minimum wage

[82] For problems and solutions for moving beyond them regarding the TRC test, see: Daykin, Elizabeth, Jessica Aiona and Brian Hedman, "Picking a Standard, Implications of Differing TRC Requirements," Presented at the American Energy Services Professionals Conference, Orlando, Florida, January 19, 2011; Hall, Nick, et al, "Reaching our Energy Efficiency Potential and Our Greenhouse Gas Objectives - Are Changes to our Policies and Cost Effectiveness Tests Needed?" Presented at the American Conference for an Energy Efficient Economy, March 2009 (http://www.aceee.org/files/pdf/conferences/mt/2009/E2%20_Hall.pdf);Neme, Chris & Martin Kushler, "Is it Time to Ditch the TRC? Examining Concerns with Current Practice in Benefit-Cost Analysis." *Proceedings of the 2010 ACEEE Summer Study on Energy Efficiency in Buildings*. Monterey, California. Pp. 5-299 to 5-310. Peach, H. Gil & John Mitchell, 350/650/1050 – Implications of Global Warming for Demand-Side Management," to be presented at the International Energy Program Evaluation Conference, Boston, August 2011.

[83] Wilks, S.S., "Some Aspects of Quantification in Science," Pp. 5-12 in Harry Woolf, ed., *Quantification*, A History of the Meaning of Measurement in the Natural and Social Sciences. Indianapolis: Bobbs-Merrill, 1961.

as an indicator of need. But, for non-metropolitan Washington a household with one full time worker earning the Washington minimum wage would have to make 169% of minimum wage to afford a one-bedroom rental and 207% for a two bedroom rental.[84] So, using the traditional guide of housing costs, the Washington minimum wage is short of financial need by something between 169% and 207% and is not a valid indicator. Or, we might use the official Federal Poverty Level (FPL). However, virtually no one, including the government itself, believes that the FPL is a valid indicator of need, as can be ascertained by government's own practice in setting eligibility limits for its weatherization program at the maximum of two-hundred percent of poverty or sixty percent of state median income (see below). However, the recent debates regarding family income eligibility for child health insurance (CHIP) were part of a truth-seeking search for accurate income eligibility reflecting need and supersede the 1960's search to define need as the FPL. In Washington State eligibility for CHIP is set at 300% of poverty.[85] Now, these are generally the same households viewed from prisms of housing, energy, and child welfare. What these differing angles of vision have in common is that neither the Washington minimum wage nor the FPL is in any way credible as indicators of need.

The best indicator of need, used across the US but not adopted as "official" is the Self-Sufficiency Standard.[86] This indicator satisfies all three aspects of the definition for scientific quantification (it is reproducible, reliable and valid). It also corresponds to a commonsense or everyday practical definition of need: a family is in need if it has to sacrifice basic necessities (for example choose between decent safe and sanitary housing and nutritious food, between child care and work, between health care and paying the utility bills, between the mother paying for necessary prescription drugs for herself and a child receiving health care, and the like). The Self Sufficiency Standard takes actual prices, price relationships, geographic variation, taxes and tax credits, size of family and composition of family (family type) into account. The Self Sufficiency Standard suggests that an accurate indicator of need for non-metropolitan Washington ranges from a minimum of 160% FPL for a family of one adult to about 270% FPL for a family of two adults, one pre-schooler and one school age child, but the percentage varies by family size and county (for comparison, the result for the same family would be 371% FPL for King County).[87] Detailed tables by family size and county are available and could easily be matched to Cascade's Washington service territory.[88]

[84] These results assume fair housing cost at thirty percent of income. Table for Housing Wage as Percent of Minimum Wage for State of Washington, Non-Metropolitan areas, National Low Income Housing Coalition, Out of Reach 2010. For interactive tables, see: http://www.nlihc.org/oor/oor2010/.

[85] Kaiser. See: http://www.statehealthfacts.org/profileind.jsp?rgn=49&cat=4&ind=204.

[86] Pearce, Diana M., The Self-Sufficiency Standard for Washington State 2009. Seattle, Washington: Workforce Development Council of Seattle-King County and Wider Opportunities for Women, 2010.

[87] Approximate results developed by dividing tabled values of Annual Self-Sufficiency Wage by Federal Poverty Level by family type for selected Washington non-metropolitan counties. For Annual Self-Sufficiency Wage, see Pearce (2010).

[88] Pearce (2010).

However, while the Self-Sufficiency Standard provides the scientifically best indicator of need, it has not been officially adopted. The official definition for low-income energy needs is as follows:[89]

> The Federal guidance has increased the Washington State Low-Income Weatherization Program Eligibility Guidelines to 200% of federally established poverty guidelines. It is acceptable to consider total household income at or below 200% Federal poverty or 60% State median income, whichever is greater. However our priority is still 125% of federal poverty guidelines.

Since Cascade's low income program is coordinated with the Community Action Agencies, and this is the guidance they are receiving from the state, it is likely that the practical definition in use by the Community Action Agencies is one-hundred twenty-five percent of poverty, with exceptions up to the authorized limits for special cases.[90]

A total of 318,664 Washington households are below one-hundred twenty-five percent of the Federal Poverty Level.[91] This is about seventeen and one half percent (17.5%) of households based on the number of Washington households in 2000.[92] Applying this percentage to Cascade's 168,158 Washington customers on Residential Rate 503 in September, 2010,[93] the result is 29,428 households. This can be rounded to 30,000 households as a reasonable indication of need for the low income program under current definitions. Of course the Self-Sufficiency Standard would be a much sounder indicator and would result in a higher – and more valid -- level of need.

Recommendation 10: Explore adoption of the Washington Self Sufficiency Standard as the indicator of eligibility for the low-income program.

[89] Washington State Low Income Weatherization Program Income Eligibility Guidelines. See: http://www.commerce.wa.gov/DesktopModules/CTEDPublications/CTEDPublicationsView.aspx?tabID=0&ItemID=8780&MId=870&wversion=Staging.

[90] State guidance further specifies that service may be provided above the 125% focus if households at or below that income level have been served.

[91] Colton, Roger, "On the Brink: 2010, The Home Energy Affordability Gap". Belmont, Massachusetts: Fisher, Sheehan & Colton, Public Finance and General Economics, April 2011, state data sheet for Washington (http://www.homeenergyaffordabilitygap.com/).

[92] US Census Bureau, Washington households in 2000 from http://quickfacts.census.gov/qfd/states/53000.html.

[93] Cascade Natural Gas Corporation Annual Decoupling Mechanism Report Calendar Year 2010, March 2011, Appendix C, Page 1.

Effect on Typical Low-Income Customer

The effect of the pilot on the low-income customer is the same as the impact on a typical customer. During the pilot the only bill impacts on customers from the decoupling mechanism came from the rate credit associated with the fifteen month 2008 decoupling margin refund ($0.00233 per therm). This rate credit was applied to residential Rate 503 and commercial Rate 504 customers. The conservation program that accompanies decoupling does have an impact on low-income customers. Tables 67 & 68, (identical with Tables 37 & 38), demonstrate this cost.[94]

Table 67: Temporary Rate Increments for Conservation Program Costs.

Temporary Rate increments for Conservation Program Costs	
November 2005 through October 2007	$0.00155/therm
November 2007 through October 2008	$0.00160/therm
November 2008 through October 2009	$0.00257/therm
November 2010 and forward	$0.02477/therm

These temporary rate increments for conservation program costs are charged to all core rate schedules (Rates 502, 503, 504, 505, 570 and 571). These are the schedules eligible for conservation services. Illustrative bill impacts, depending on therms used are shown in Table 68.

Table 68: Bill Adder for Conservation Cost.

Annual Impact
of Temporary Rate Increments Associated with Conservation Costs
by Annual Number of Therms Used

Dates	Therms						
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
	300	660	710	1800	2400	3295	4500
11/07-10/07	$0.47	$1.02	$1.10	$2.79	$3.72	$5.11	$6.98
11/07-10/08	$0.48	$1.06	$1.14	$2.88	$3.84	$5.27	$7.20
11/08-11/10	$0.77	$1.70	$1.82	$4.63	$6.17	$8.47	$11.57
11/10 ->	$7.43	$16.35	$17.59	$44.59	$59.45	$81.62	$111.47

Note: The average Rate 503 residential customer is represented by 660 or 710 therms (Cols. 2 & 3); the average Rate 504 commericial customer by 3,295 therms (Col. 6).

[94] In 2009, the company did not file a temporary adjustment filing and therefore the 2010 PGA included two years worth of programmatic cost deferrals (*i.e.*, deferred balances from July 2008 thru June 30, 2010). Source: E-mail to Gil Peach from Kathie Barnard on May 22, 2011.

Generally a meaningful cost for a low income customer is five dollars.[95] So, in general, there was no important impact on low income customers during the pilot. However, beginning in November 2010 conservation ramping does have a meaningful impact on low income customers using three-hundred or more therms per year.

Looking forward from the pilot, low income customers using six-hundred and sixty (660) to seven-hundred and ten (710) therms annually, an approximation to the residential average use, will have to pay the additional $16.35 to $17.59 for the year to support the energy efficiency program. "High use" low income residential non-participants using twelve hundred therms annually will experience an overall bill increase of about thirty dollars ($30.00) for the year. This amount will increase as conservation ramps. For participants in single family gas heated homes, however, these amounts are much more than simply offset by a reduction in annual bills of thirty-five percent to thirty-eight percent (35%-38%).

Regulatory Impact

Regulatory impact considerations include rate cases, outside resources to support the pilot, and social impacts and benefits.

Rate Cases

No Washington rate cases were filed by Cascade Natural Gas during the pilot.

Outside Resources

A natural concern with any pilot is the resources it requires. The focus in this subsection is on "outside" resource, referring to additional commitment of time and resources by staff and parties. Following the negotiation of the settlement agreement, the Cascade Washington decoupling pilot required meetings, phone calls, review of documents and of drafts of the report and a number of e-mails back and forth among the parties, the staff, and the Company. The development of the RFP for the examination of the decoupling mechanism also took serious effort.

Pilots pursuant to a settlement agreement with many parties inherently require considerably more work on the parts of several parties and particularly staff than an independent program that is initiated by a utility internally. However, in perspective, with reliance on the Internet, pilots today are greatly facilitated by reliance on primarily electronic communication. Without the Internet many more physical meetings and face-to-face discussions among parties would have been required.

Though the decoupling pilot required focus and attention, the amount of effort required was not above that required by other pilots in other subject-matter areas, and considerably less that would have been required prior to reliance on the Internet.

[95] This can be demonstrated at a hearing by asking a low income customer to show the contents of a shopping bag containing five dollars worth of discounted food items. This is very effective testimony at a hearing.

Social Impact and Benefit

Two social benefits are reviewed in this section of the study, Non-Energy Benefits (NEBS) and possible impact on sales of energy efficient appliances.

Decoupling and Non-Energy Benefits

Theoretically, decoupling leads to Non Energy Benefits (NEBS) because removing the impetus to constant marketing, promotion, and sales of natural gas will result in less natural gas use. This is a reasonable theoretical position taken by advocates of decoupling. And, as noted by Nadel, natural gas is currently exempt from the direct rebound effect of the Jevons paradox. For natural gas, "...growing efficiencies are driving absolute declines in consumption since there are not significant new uses of natural gas."[96] This means that natural gas environmental NEBS are real and permanent, definitely so for the residential sector and virtually so for the commercial sector.

A 2001 survey of studies of NEBS associated with residential whole house weatherization found a range of ten percent to fifty percent of the value of energy savings from a utility perspective and a range of one-hundred percent to three-hundred percent of the value of household energy savings from a social perspective.[97] Savings from natural gas heated homes are towards the higher end of the NEBS savings range. The most relevant study, a review of NEBS in studies of the federal/state Weatherization Assistance Program, demonstrates that the sum of NEBS associated with low income whole house weatherization is slightly greater than the total value of the energy savings (100%+).[98] This low income weatherization study demonstrates significant benefits to utilities/ratepayers, to households, and to society. The specific non-energy benefits analyzed are as follows:

Utility/ratepayer benefits: (1) avoided rate subsidies; (2) lower bad debt write-off; (3) reduced carrying cost on arrearage; (4) fewer notices and customer calls; (5) fewer shut-offs and reconnections for payment delinquency; (6) reduced collection costs; (7) fewer emergency gas service calls; (8) transmission and distribution (T&D) loss reduction; and (9) insurance savings.

[96] Nadel, Steve, "Is It True That the More Efficient a Product Becomes, the More Its Owner Will Use It? May 4, 2010. See: http://theenergycollective.com/aceee/55991/. In the 1850's Jevons, an economist, studied the introduction of energy efficiency to the burning of coal. Jevons concluded that increases in efficiency in the use of coal tended to result in cost savings, leading in turn to the increased use of coal, erasing the initial efficiency gains. There is also an indirect rebound effect due to the use of dollars saved for other purposes which also increases energy use for those purposes.

[97] Skumatz, Lisa, 2001. Non Energy Benefits (NEBS) – A Comprehensive Analysis and Modeling of NEBS for Commercial & Residential Programs." In AESP, 12th National Energy Services Conference Proceedings. Jupiter, Florida: Association of Energy Services Professionals International, 2001, Pp. 459-471.

[98] Schweitzer, Martin & Bruce Tonn, *Nonenergy Benefit from the Weatherization Assistance Program: A Summary of Findings from the Recent Literature*. Oak Ridge, Tennessee: Oak Ridge National Laboratory, April 2002, ORNL/CON-484.

Household benefits: (1) water and sewer savings; (2) property value benefits; (3) avoided shut-offs and reconnections; (4) reduced mobility; and (5) reduced transaction costs. The other type of household benefit concerns the safety, health, and comfort of residents and has three components: (1) fewer fires; (2) fewer illnesses; and (3) improved comfort and related factors.

Societal benefits: (1) environmental benefits, (2) social benefits, and (3) economic benefits.

The pilot's carbon offset is summarized in Table 56.[99]

Table 69: Pilot Carbon Offset.

Carbon Offset (CO2 avoided in Thousands of Pounds)				
Year	**Residential**	**Commercial**	**Low Income**	**Total**
2008	2,884	2,225	162	5,271
2009	3,176.50	3,197.00	170.9	6,544.40
2010	2,197.20	2,602.50	357.4	5,157.10
Totals	8,258	8,025	690.3	16,973

Appliances

The appliance question is whether there has been an increase in the sales of energy efficient appliances during the pilot. The answer is unequivocally "yes." However, in terms of attribution the pilot had a small role. This is because there have been other major promotions operating in the service territory.[100]

- For the duration of the pilot there has been stepped-up promotion of Energy Star appliances by the big box stores. For at least 2009 and 2010, Home Depot has had a standing 10% discount on Energy Star appliances costing $397 or more, and at times during this period has increased the discount to 15% for special promotions. Lowes has run similar promotions.

- The ARRA federal/state appliance program for Washington, "Washington Appliance Rebates" began August 3rd, 2010 for purchases made on or after June 29, 2010 and closed its waitlist on

[99] 2008 figures are updated from Cascade Natural Gas Corporation, Annual Decoupling Mechanism Report, Calendar Year 2009, March 2010. 2009 results are updated from Cascade Natural Gas Corporation, Annual Decoupling Mechanism Report, Calendar Year 2010, March 2011. 2010 results are from Cascade Natural Gas Corporation, Annual Decoupling Mechanism Report, Calendar Year 2010, March 2011.

[100] Note that one important effect of true decoupling is to help the company to be supportive of these types of efforts, rather than to be reluctant or opposed because of the reduced natural gas sales that such efforts produce.

December 9, 2010. This was a $6,264,000 promotion in Washington run by the Washington Department of Commerce.

- In addition, the federal government ran a 15% tax credit on the cost of major Energy Star Appliances in 2009 and 2010.

Most of the energy-efficient appliance promotion activity in Washington involves electric appliances but gas tankless water heaters and gas storage water heaters were included in the Washington Appliance Rebates. During the pilot, sales of high efficiency gas furnaces were promoted by means of the fifteen percent (15%) federal tax credit which has since been reduced to five percent (5%) and there is at least anecdotal evidence that the credit is helping to increase sales of efficient gas furnaces. For a time during the pilot a customer could take advantage of the Washington Appliance Rebate, the Cascade incentive and the federal tax credit, depending on the appliance.

Cascade's incentives played a role in increased sales of energy efficient gas appliances. Pilot conservation participants, of course, took advantage of the Cascade incentive, but the numbers are small in relation to the number of Cascade customers. Also, according to results of the study surveys, even with high quality promotional materials, well designed advertising and pro-active dealer communications efforts many non-participants are still unaware of the Cascade incentives. Those unaware include approximately 70% of residential non-participants and 78% of commercial non-participants.

Conclusions

This section summarizes findings from throughout the text of the study. There are fifteen findings.

1. Cascades' Washington decoupling mechanism functions as planned (in line with the theory and logic model of decoupling programs). Since the decoupling mechanism worked for the pilot, such decoupling should be regarded as a proven effective approach.
   See P. 12.

2. The mathematics of Cascades' Washington decoupling mechanism was correctly carried out.
   See P. 17.

3. Direct pilot bill impacts on included classes (Rates 503 & 504) are so small that they are essentially negligible.
   See P. 20.

4. The direct pilot bill impacts on excluded classes (Rates other than 503 & 504) are nonexistent. However, there is some direct and indirect benefit to all customers from Cascade's provision of energy conservation information and DSM programs and incentives. See P. 21.

5. The pilot had a positive impact on realigning the utility focus from increasing sales to improving customer service through provision of energy conservation information, energy conservation programs and customer incentives to conserve energy.
   See P. 22.

6. During the three-year pilot, the Company did not recover revenue margin in any of the three years. See P. 22.

7. The decoupling pilot has fulfilled its design, following from the Settlement Agreement.
   See P. 24.

8. There are disincentives in the current structure of the decoupling mechanism: lack of symmetry in the conservation performance award/penalty mechanism, disincentive on the cost side, and the unreliability of award from the award/penalty mechanism for excellent performance.
   See P. 26.

9. There is no justification for reducing the Company's authorized return on equity based on the operation of its decoupling mechanism. However, we condition this finding on a resetting of the base year for the decoupling mechanism after every two years.
   See P. 26.

10. Though the decoupling mechanism works as planned and the mathematics of calculations have been correctly performed, the pattern of negative results and swings in monthly variance and in cumulative deferred amount suggest that a better award/penalty mechanism might be found. One preferable characteristic of an award/penalty mechanism is a consistently positive value when performance is positive and a trend of increasing value over time when conservation performance is increasingly positive.
    See P. 29.

11. A tighter showerhead specification should be used to obtain more conservation savings. See P. 49. Savings from the showerhead program were not counted towards the conservation target.

12. The pilot did not include an independent third-party evaluation of energy savings results.
    See P. 58.

13. There was no financial return to Cascade as a result of the pilot. However, the decoupling mechanism did provide a valuable kind of hedge.
    See P. 60.

14. The fact that Cascade launched and sustained substantial conservation communications, programs and incentives demonstrates the integrity of Cascade's commitment to their side of the business arrangements set forth in the Settlement Agreement, and demonstrates a substantial good faith effort on the part of Cascade.
    See P. 60.

15. Cascade has progressively improved its understanding and relationship with the Community Action Agencies that deliver low-income weatherization within its service territory. However, natural gas energy efficiency programs are disadvantaged relative to electric low-income programs in that the CAAs have to incur risks of timing and often unknown availability of funds from other sources in order to fully weatherize a gas heated home. The disparity with electric low-income weatherization (which generally does not present this complex problem) puts gas customers at a disadvantage and may result in natural gas program low-income funds being much harder for the agencies to use.
See P. 94.

Recommendations

On balance, we would recommend continuing a decoupling mechanism for Cascade Washington, with the modifications suggested below.

The study leads to ten specific recommendations:

1. There is a reasonable and legitimate rationale in improving balance or fairness and in improving the effectiveness of Cascade's Washington decoupling mechanism if the annual year-end award/penalty for conservation performance is improved at the top end of the performance scale by moving the maximum award from 90% to 100% of the year-end variance amount.
See P. 23.

2. The base year for the decoupling mechanism should be reset after every two years.
See P. 26.

3. There is a need to consider the operation of the current earnings cap on the cost side, specifically as it may not provide the right signal (and award) for cost control.
See P. 26

4. The current structure of the conservation performance award/penalty mechanism along with the operation of the earnings cap has not resulted in Cascade receiving a reliable award calibrated to DSM performance during the pilot. Accordingly, a small incentive per therm conserved might be considered as an extension of the decoupling mechanism to provide reliable award calibrated to good work in energy conservation.
See P. 27.

5. The annualized value of energy savings from the cumulative conservation installations has the preferred characteristics of being always a positive number and having a trend of increasing value over time. A portion of this value or a model based on this value might be considered in place of the current mechanism for the award/penalty structure for each year-end in which the cumulative deferred amount (Table 15) is negative.
See P. 29.

6. Upgrade the showerhead specification to 2 gallons per minute or less at 80 pounds per square inch. See P. 49. Savings from the showerhead program were not counted towards the conservation target.

7. In any future energy conservation effort, provision for periodic independent evaluation of energy savings claimed by the Company and/or the delivery agent should be included in the project design. This evaluation should include an on-site inspection component. See P. 58.

8. An increase in the fixed portion of the bill as an alternative to decoupling is not recommended because it correspondingly diminishes the per-unit "price signal" that customers see regarding their natural gas consumption, and thereby reduces the incentive for pursuing energy conservation. Moreover, shifting costs to the fixed portion of the bill relatively penalizes those who conserve and use little energy, and relatively rewards those who are wasteful. The recommendation is for the current decoupling mechanism to be retained, but to raise the potential award from the conservation governor mechanism to 100%. We further recommend that for years in which the earnings cap would otherwise require a write-off, there should be some performance incentive award linearly related to level of progress in meeting target. Further that energy use of new customers should be removed from the earnings cap assessment. Should it be determined not to restart decoupling, a pure LRAM could be considered, but is overall an inferior approach. Since the decoupling mechanism worked for the pilot, such decoupling should be regarded as a proven effective approach. See Page 74.

9. Cascade should explore the possibilities of modifications to the cost test for low-income programs. Consider requesting commission approval to use the ARRA weatherization cost test (undiscounted BTU/dollar) as the preferred test for low-income programs (in place of the Total Resource Cost test. As a second (lower ranked) alternative see if the Commission will consider a modification of the current Total Resource Cost test to substitute a social discount rate (Wisconsin uses 2%) for the current utility effective discount rate in order to make program funding per measure fully cover measure cost. There are many ways to keep but tweak the Total Resource Cost test for the low-income sector. A reasonable goal is to provide funding to the CAAs for the full cost of either gas weatherization jobs as a first goal, or of each individual measure of a set as a lower ranked goal (such as replacement gas furnaces and replacement gas water heaters). See P. 96.

10. Explore adoption of the Washington Self Sufficiency Standard as the indicator of eligibility for the low-income program. See P. 98.

Appendix: Study Questions

Mechanism Structure and Design (see P. 3 -17)

1. **Customer classes.** We will review the included and excluded classes with Cascade, discuss with the parties, and do test runs with customer data from excluded classes to estimate effects (see Pp. 17-21.

2. **Removal of Disincentives.** To determine the extent to which the decoupling mechanism removes the disincentive to promote EE, first we will use a descriptive approach to describe the mechanism, present the equations and their elements and illustrate how the mechanism works. Then, using accounting data, we will develop a quantitative analysis to determine the extent to which the decoupling mechanism – in actual operation –removes the disincentive (see P. 21).

3. **Fulfillment of Intentions.** To determine the extent to which the mechanics of the pilot carry out the Order and intentions of parties, we will first consult with Cascade and with the parties to determine if there are any perceptions of deviation. We will also review the order and settlement documents and compare with the experience of actual implementation. We will also document whether program penalties have been implemented, analyze the effects of the cap on the surcharge level, and develop the effects of using the rates set in 2006 as a baseline (see P. 23).

4. **Creation of Disincentives.** To determine if the mechanism creates any unanticipated disincentives, we will first ask Cascade and parties about this topic to see if there is any perception of disincentives from decoupling. We will review the mechanism as specified in the order. We will also review the model results developed above based on actual data (see P. 24).

5. **Mathematical Summary:** We will provide total month and annual deferrals with a clear explanation of deferral and recovery periods (see P. 27)

6. **Calculation Methods:** We will examine and report any changes to methods and calculations by Cascade over the pilot, and analyze their purpose(s) and impact(s) (this is combined with the Mathematical Summary, see P. 27).

7. **Challenges:** We will explore the existence of any challenges for method, including input values for accounting journal entries over the pilot. We will also do a sensitivity analysis to assess how change in the magnitude of the range in weather adjustment compares to total lost margin; also to any reduction in use of due to Cascade conservation programs (see P. 29).

8. **Numbers of New Customers:** We will report the number of customers added each month, by rate schedule, in the context of the total monthly number of customers served (see P. 33).

9. **Actual vs. Normalized Usage:** We will develop the actual and weather normalized usage per customer, for existing and new customers (new customers are not differentiated; normalized usage is covered through the study since that is the basis for the decoupling mechanism; effect of actual non-weather adjusted usage is covered beginning on P. 67).

10. **Impact on New Customers:** We will develop the impact of the mechanism on new customers (the impact on new customers is the same as on existing customers).

Associated Conservation Efforts and Achievements (see P. 36)

1. **Basic Outcomes:** We will report achievements vs. targets for each pilot year. We will also determine if the conservation developed was cost-effective (see P. 36).

2. **List Conservation Effort:** We will report all conservation programs, initiatives, incentives, and associated DSM savings estimates annually for available years of history. We will then discuss change, if any, in these offerings following January 2007 (see P. 40).

3. **Actual vs. Deemed Savings:** We will compare actual vs. deemed savings for each program year. To examine DSM funding changes, we will develop the "before and after" table based on Cascade records, and then consider and write-up results (see beginning on P. 46).

4. **Program vs. Non-Program Energy Reductions.** We will develop the portion of total energy savings due to Cascade's conservation programs vs. other factors (for example, price elasticity, codes, the economic collapse, and other factors) (see P. 52).

5. **Program Costs and Energy Savings:** We will explore the relationship between expenditures for conservation efforts and energy savings during the pilot. This will include a comparison to the pre-pilot baseline period and a year-over-year percentage. In addition a breakdown of expenditure by customer class (rate schedule) for actual conservation vs. administrative overheads will be developed (see P. 54).

6. **Sequencing of Change:** We will provide an accounting of changes in the scope and size of the conservation effort over the pilot period and a comparison to the pre-pilot baseline period. This accounting will be by customer class (rate schedule). At the measure level, we will estimate attribution of savings to measures, showing percentage change by measure. We will also show the effect of any new measures added and of any measures dropped (see P. 57).

7. **Numbers Served:** We will report how many homes and business (separated by commercial and industrial) have received conservation assistance since the launch of conservation efforts, and since the launch of the decoupling pilot (see P. 58).

8. **Cascade's Savings Estimates:** We will present Cascade's savings estimates for each of its conservation programs and measures along with the basis for these estimates. We will also present any changes in these savings estimates following decoupling (see P. 58).

9. **Assessment:** We will report on all evaluation, measurement, and verification conducted by or on behalf of Cascade to examine the accuracy of its energy savings estimates (see P. 58).

Corporate Integration of Philosophy and efforts (see P. 59)

1. **Operating Practices.** We will report on any measureable impact that decoupling has had on corporate operating practices related to conservation, along with documentation. Also, we will report on any associated increased support of outside conservation, for example helping tighten building codes (see P. 60).

2. **Organizational Changes.** We will report on any organizational changes related to conservation that have occurred since January 2007; for example, staff and subcontractor positions added to support conservation compared with the pre-pilot baseline period total (see P. 61).

3. **Behavior/Commitment.** We will report on how CNGC behavior/commitment to conservation was demonstrated within and outside the company prior to and following January 2007 (see P. 61).

4. **List of Venues.** To report Cascade officers and staff statements on conservation in conferences and public events, we note that utilities keep very complete records of mentions of the utility in news media and staff presentations at conferences are generally cleared. We will ask Cascade to provide both types of records and we will go through them to pull out, count, and classify relevant communications in order to demonstrate a measureable difference (if any) between the pre-pilot baseline and post pilot implementation (see P. 62).

Rate Designs and the Effects of Weather (see P. 67)

1. **Weather-Related Impact.** We will develop the alternate bill impacts if weather-related impact on usage was included (see P. 67).

2. **Rate Design.** We will indicate alternate rate designs that could be expected to mitigate rate volatility for customers while stabilizing revenue for the company (see P. 71).

Financial Impact (see P. 74)

1. **Effects and Safeguards.** We will determine the effectiveness of the 8.85% rate of return earnings cap, document any additional safeguards to prevent over-earning, and analyze the effect of decoupling in mitigating over and under collections (see P. 74).

2. **Conservation Lost Revenue vs. All Lost Margin.** We will compare lost revenue due to effective energy savings as a portion of all lost revenue from reduced energy use for the pilot period (see P. 75).

3. **Rate Adjustments.** We will document and discuss all rate adjustments implemented by Cascade due to the pilot (see P. 77).

4. **Actual and Relative Impacts.** We will develop the pretax margins and net income impact resulting from recoverable revenue deferrals for all pilot years. We will also present these impacts as relative percentages (see P. 77).

5. **Lost Margins.** We will compare lost margins for the pre-pilot baseline period and after decoupling. During decoupling, we will also compare lost margins from Cascade conservation to decoupling deferrals (by rate schedule) (see P. 78).

6. **Surcharge Revenue.** We will report the total amount of decoupling surcharge revenue collected from ratepayers each month during the pilot (see P. 78).

7. **Conservation Revenues.** We will report any conservation payments to Cascade during the pilot period (see P. 78).

8. **Alternative Deferred Revenue and Lost Margin Recovery.** We will develop the monthly, annual and cumulative amount of revenue deferred and lost margin recovered by the decoupling mechanism during the pilot, with and without adjustment to reflect the deferral limit as well as the percent adjustment due to the conservation or earnings test (see P. 79).

Customer Impact (see P. 79)

1. **Factors in Usage Reduction.** We will examine factors in usage reduction (by rate class, and between low-income and other residential customers). These factors, for example, may include changes in avoided cost and the economic depression of the customer classes. Actual unemployment (official unemployment plus discouraged workers plus part-time workers seeking full-time jobs) will be one of the factors used in the regression (see P. 79).

2. **Service Quality.** We will assess whether or not (and if so, to what degree) there has been a change in service quality due to the existence of the decoupling mechanism (see P. 81).

3. **Customers and Usage.** We will report on how many customers CNGC had per rate schedule and proportion of usage before and during the pilot. We will also report the rate of customer growth before and after the pilot, and discuss any change (see P. 82).

4. **Effect on Non-Participants.** We will develop the bill impact and total cost of the decoupling mechanism to customers not participating in conservation activities (see P. 85; combined with typical customer).

5. **Typical Customer.** We will develop the approximate cost experienced by a typical customer for funding of conservation programs and recovery of decoupling deferrals (see P. 85).

6. **Allocation to Customer Classes.** We will report on how Cascade allocated the impact of the decoupling pilot across all relevant customer classes as this allocation affected bills and rates (see P. 85; combined with typical customer).

7. **Incentive and Behavior.** We will examine how the mechanism helped create or maintain a customer incentive for efficient use of gas; also any changes in customer behavior that can be directly attributed to this mechanism (see P. 87).

8. **Billing System.** We will examine and report how Cascade's billing system has accommodated decoupling and whether or not (and if so, to what degree) customer inconvenience/confusion resulted (see P. 87).

Low-Income Impact (see P. 87)

1. **Low-Income Proportion.** We will report the proportion of total Cascade Washington conservation measures and incentives that are provided through the low-income program (see P. 88).

2. **Outreach and Education.** We will document Cascade's low-income outreach and education efforts prior to decoupling and post-decoupling, along with estimated costs and associated energy savings (see P. 91).

3. **Program Changes.** We will document and discuss any program changes or expansions to the low-income conservation program since decoupling (see P. 92).

4. **Needs Analysis.** We will estimate the low-income population in Cascade's service territory (see P. 96).

5. **Effect on Typical Low-Income Customer.** We will estimate the effect of the combined average bill impact from decoupling and the cost of conservation surcharges on the average low-income customer (see P. 99).

Regulatory Impact (see P. 100)

1. **Rate Cases.** We will list any rate cases, with dates, that Cascade filed during the pilot (see P. 100).

2. **Outside Resources.** We will estimate any additional commitment of time and resources necessary from staff and other concerned parties as a result of decoupling (see P. 100).

Social Impact and Benefit (see P. 101)

1. **Non Energy Benefits.** There are Non Energy Benefits (NEBs) associated with conservation efforts. To determine the extent to which the decoupling can be tied to direct/indirect NEBs, we will consult with Cascade and the parties, and also use NEBs estimates established in prior DSM and low-income weatherization studies (see P. 101).

2. **Decoupling and NEBS.** Extending the discussion to the area above, we will provide an assessment of whether Cascade's decoupling can be tied to a direct or indirect environmental benefit, such as the reduction of greenhouse gases (see P. 101; combined with Non-Energy Benefits).

3. **Appliances.** The answer to the question of whether there has been an increase in sales of energy efficient appliances since Cascade began its DSM efforts and to the question of whether there is a difference pre-pilot vs. post-implementation, comparisons will be developed. Whether or not results can be attributed to the pilot is problematic, given the stepped-up and now constant promotion of efficient appliances by big box stores and the piggybacking of federal stimulus program appliance incentives. We will develop an analysis (see P. 102).

References

Avista Docket UG-060518, Order 10, Page 118, §299.

Cascade Natural Gas, Decoupling Mechanism Report for Calendar Year 2008, March 31, 2009.

Cascade Natural Gas Decoupling Mechanism Report for Calendar Year 2009, March 31, 2010.

Cascade Natural Gas Decoupling Mechanism Report for Calendar Year 2010, March 31, 2011.

Colton, Roger, "On the Brink: 2010," The Home Energy Affordability Gap." Belmont, Massachusetts: Fisher, Sheehan & Colton, Public Finance and General Economics, April 2011, state data sheet for Washington (http://www.homeenergyaffordabilitygap.com/).

Daykin, Elizabeth, Jessica Aiona and Brian Hedman, "Picking a Standard, Implications of Differing TRC Requirements," Presented at the American Energy Services Professionals Conference, Orlando, Florida, January 19, 2011.

Energy Efficiency Resource Assessment Washington Service Territory. Portland & Seattle: Stellar Processes and Ecotope, 2006.

Hall, Nick, et al, "Reaching our Energy Efficiency Potential and Our Greenhouse Gas Objectives - Are Changes to our Policies and Cost Effectiveness Tests Needed?" Presented at the American Conference for an Energy Efficient Economy, March 2009. See: http://www.aceee.org/files/pdf/conferences/mt/2009/E2%20_Hall.pdf.

Hill, Lawrence J. & Marilyn A. Brown, "Estimating the Cost Effectiveness of Coordinated DSM Programs." *Evaluation Review*, Vol. 19, No. 2, April 1995, Pp. 181-196.

Mills, C. Wright, "Situated Actions and Vocabularies of Motive," *American Sociological Review*, Vol. 5, December 1940, Pp. 904-913.

Nadel, Steve, "Is It True That the More Efficient a Product Becomes, the More Its Owner Will Use It? May 4, 2010. See: http://theenergycollective.com/aceee/55991/.

National Action Plan for Energy Efficiency (NAPEE), *Aligning Utility Incentives with Investment in Energy Efficiency*. Washington, DC: US Environmental Protection Agency, 2007.

Neme, Chris & Martin Kushler, "Is it Time to Ditch the TRC? Examining Concerns with Current Practice in Benefit-Cost Analysis." *Proceedings of the 2010 ACEEE Summer Study on Energy Efficiency in Buildings*. Monterey, California. Pp. 5-299 to 5-310.

Morse, William L. & H. Gil Peach, "Control Concepts in Conservation Supply," *Energy*, Vol. 14, No. 11, Pp. 727-735, 1989.

Peach, H. Gil & John Mitchell, 350/650/1050 – Implications of Global Warming for Demand-Side Management," to be presented at the International Energy Program Evaluation Conference, Boston, August 2011.

Pearce, Diana M., *The Self-Sufficiency Standard for Washington State 2009*. Seattle, Washington: Workforce Development Council of Seattle-King County and Wider Opportunities for Women, 2010.

Skumatz, Lisa, 2001. Non Energy Benefits (NEBS) – A Comprehensive Analysis and Modeling of NEBS for Commercial & Residential Programs." In *AESP, 12th National Energy Services Conference Proceedings*. Jupiter, Florida: Association of Energy Services Professionals International, 2001, Pp. 459-471.

Schweitzer, Martin & Bruce Tonn, *Nonenergy Benefit from the Weatherization Assistance Program: A Summary of Findings from the Recent Literature*. Oak Ridge, Tennessee: Oak Ridge National Laboratory, April 2002, ORNL/CON-484.

Schweitzer, Marty & Linda Berry, *Evaluation of the Washington State Weatherization Assistance Program*. Oak Ridge, Tennessee: Oak Ridge National Laboratory, ORNL/CON-478, March 2001.

U-100522, Report and Policy Statement on Regulatory Mechanisms, Including Decoupling, to Encourage Utilities to Meet or Exceed their Conservation Targets.

UG-060246, Order 05, effective January 12, 2007.

UG-060256, Order 06, Order approving conservation and low income weatherization plan, subject to conditions; authorizing and requiring compliance filing; denying Public Counsel's motion for leave to file comments, August 16, 2007.

UG-060246, Order 07, Order Accepting Addendum to Conservation Plan; Approving Tariff Filing, dated October 1, 2007.

Washington State Low Income Weatherization Program Income Eligibility Guidelines. See: http://www.commerce.wa.gov/DesktopModules/CTEDPublications/CTEDPublicationsView.aspx?tabID=0&ItemID=8780&MId=870&wversion=Staging.

Wilks, S.S., "Some Aspects of Quantification in Science," Pp. 5-12 in Harry Woolf, ed., *Quantification*, A *History of the Meaning of Measurement in the Natural and Social Sciences*. Indianapolis: Bobbs-Merrill, 1961.