Cascade Natural Gas Corporation
Annual Conservation Achievement Report
Calendar Year 2017

Background

On October 1, 2007 the Washington Utilities and Transportation Commission (WUTC) approved an addendum to Cascade Natural Gas's Conservation Alliance Plan (CAP) and associated Decoupling Pilot, which was developed in compliance with the Commission's Order 06 in Docket UG-060256. As part of this addendum, the Company agreed to submit "an annual report to the Commission on the achievement of the Calendar Year (CY) therm savings target, along with its Commission Basis results of operations report". Following this order, the Company submitted an annual report by March 31 of each year, to report prior years' Energy Efficiency (EE) achievements and associated CAP deferrals. As of October 1, 2010, the Pilot Decoupling Mechanism and accompanying Conservation Plan, approved by the WUTC on October 1, 2007, were no longer in effect. Per its commitment in the 2010 Annual Conservation Report, the Company voluntarily continued this reporting with the WUTC, submitting its energy efficiency achievements by July 1st of the following program year. As of CY 2016 per Docket UG-152286 the Company has committed to submitting the Conservation Annual Report to the WUTC by June 1 each year, with advanced copies provided to the Company's Conservation Advisory Group 30 days prior to filing with the Commission.

The Conservation Annual Report is intended as a synopsis of Cascade's Energy Efficiency achievements and activities in the previous calendar year. This report contains the following information:

- The year's conservation achievement by program and customer type
- Total expenditures for the year by program and customer class
- Cost effectiveness calculations
- Program evaluations completed during the calendar year

Forecasting of savings potential is available for review within the Demand Side Management (DSM) section of the Company's Integrated Resource Plan (IRP). As of CY 2015 the Company submits an Annual Conservation Plan by December 1st which includes the energy efficiency targets for the following year by program and customer class, program development, measure portfolios, projected budgets, an estimate of program cost effectiveness and a list of measures or alterations planned for the following year as well as a synopsis of planned outreach efforts.

Cost-Effectiveness Inputs

Avoided costs can have a significant impact on program cost effectiveness. The Company has taken this variable into account considering the substantial incentive increases that went into effect after a June 30th tariff filing. Thus Residential, Commercial and Industrial measure cost effectiveness has been calculated based on the avoided costs as published in the

most recently approved IRP in use by the company at the time of measure install. In an effort to more fully integrate and standardize the DSM efforts within the Integrated Resources Plan (IRP), the DSM calculations utilize the same long-term discount rate as that noted in the most recently acknowledged IRP. For this iteration, the Company used the same Long-Term discount rates, inflation rates and avoided costs as those included in the Company's submitted 2014 IRP (located in Appendix H) for measures installed under the tariff in place before June 30, 2017 and the 2016 IRP (also located in Appendix H) for measures installed under the new tariff[1], which was 3.52% for the long-term discount rate and an inflation rate of 1.00% for the avoided costs and DSM efforts.

This year's report continues to attempt to capture discrete non-energy benefits to approach the value of energy efficiency measures in as nuanced a manner as feasible for the Residential and Commercial/Industrial programs. The Low-Income program continues to utilize a flat 10% of costs to represent the non-energy benefits. These non-energy benefits traditionally have the greatest impact on the Total Resource Cost test (TRC) which is included in this report. However, for the purposes of program valuation and the continuation of robust, multi-faceted energy efficiency programs, Cascade continues to utilize the Utility Cost/Program Administrator Cost test as is allowed under UG-121207 in accordance with guidance from the Conservation Advisory Group (CAG) as the primary metric of program success and cost-effectiveness.

Additionally, the Company contracted with Applied Energy Group (AEG) to perform a Conservation Potential Assessment (CPA) in 2017 to be released in Q2 2018. This CPA and its accompanying LoadMAP forecasting tool will feed into future program planning, goal setting and cost effectiveness calculations. Results from the CPA will allow the Company to recommend updates to the program portfolio including additions of new measures, and positive changes to some incentive offerings as of the next tariff update, as well as refresh deemed therm savings for select measures. As the LoadMAP tool was not available during the 2017 planning cycle, goals for this Annual Conservation Achievement Report were set using the Company's previous forecasting tool – the Technical Economic and Achievable Potential (TEA-Pot) model provided by Nexant Inc.

Summary of 2017 Program Achievements

When reviewing program achievements for 2017 it is significant to note goals assigned for the 2017 Calendar Year were created using the Company's potential forecasting tool available at the time and these goals far exceeded previous program accomplishments. The avoided costs in use for a portion of the year were relatively low compared to those calculated as part of the 2016 IRP.

[1] Docket UG-170670 Cascade Natural Gas Corporation Tariff Revision Filing, June 29, 2017

Table A: 2017 Program Achievements

	Residential	Commercial	Total
Therms Achieved	**297,216**	**260,176**	**557,392**
Measures Installed	**2587**	**189**	**2,776**
Carbon Offset (metric tons CO_{2e} avoided)	**1,576**	**1,379**	**2,955**

In Calendar Year 2017, Cascade Natural Gas Corporation achieved a deemed therm savings of **297,216** for its **Residential** program. This represents 92% of the projected goal of 323,878 therms as noted in the 2017 Conservation Plan submitted to the Commission in December 2016. CY 2017 boasts a significant increase of 125,596 therms from those reported for the 2016 program year. This represents a 73% increase in savings attributable to the Residential program over 2016 accomplishments.

Cascade achieved a deemed therm savings of **260,176** in its **Commercial and Industrial** program. This is 50% of the Company's projected savings goal of 515,998 for CY 2017, and 37,982 more therms than was achieved in the prior year.

On a portfolio level the projected savings total between Residential, Commercial and Industrial was 557,392 therms for CY 2017. When Low Income is included in the total the programs accomplished a combined **562,956** therms of savings. Neither the Residential nor Commercial/Industrial (C&I) program met the projected goal savings from the TEA-Pot model in 2017.

As mentioned in the CY 2016 Annual Report the Company implemented a tariff change at the end of June 2017, increasing incentive levels wherever possible to drive additional customer uptake. While two thirds of the year's accomplishments for this report are under the previous tariff the end of 2017 has shown a drastic increase in customer participation for the Residential program. Calendar Year 2018 continues the Residential program's upward trend in therm savings, commensurate with the current incentive levels.

On an individual basis, the Residential program proved cost effective at a Utility Cost (UCT) benefit cost ratio of **1.576**. The Commercial/Industrial program was also cost effective at a UCT benefit cost ratio of **1.176**. At a portfolio level, the combined program is cost effective at a UCT of **1.389.** See *UG-152286, CNGC 2017 Conservation Annual Rpt WP-1, 5.31.18.xlsx* for the full portfolio cost-effectiveness calculations.

Although the Company gauges cost-effectiveness primarily based on the UCT, the Total Resource Cost test is also provided for reference. Please note the CPA mentioned previously has provided recommendations and some guidance for the Company to incorporate into future TRC calculation's cost-effectiveness to better balance the metric. At this point, as expected, the programs would not be considered cost-effective under the lens of a TRC with

the Residential program calculating out to a **0.960** TRC, the Commercial/Industrial at a **0.900**, and a combined **0.932** at a portfolio level.

As holds true from past years, programmatic achievements in the C&I sectors are dependent upon a few critical deep therm-savings projects. The Company's energy efficiency team helps customers identify key Commercial and Industrial project opportunities and aids customers in reducing their energy consumption by pursuing energy-efficiency projects in partnership with local energy services companies and assists customers with capitalizing on other utility incentive program offerings as available. It is ultimately up to the customer as to whether or he or she will choose to move forward with a project. It is also common for C&I projects to stretch beyond the program year in which they were initiated. In such cases, the Company ends up building a queue, or pipeline of projects with deep energy savings potential for future years. For this reason, it is sometimes more accurate to gauge C&I program accomplishments from a two-year perspective. This also plays a key role in why the Company has elected to raise rebates, where possible, to encourage businesses to engage in these upgrades sooner in their planning processes to curtail some of this standard delay.

It is important to recognize the number and impact generated by custom energy efficiency projects, which are variable from year to year, meaning the numbers achieved in following years will vary in an ebb and flow pattern. The Company remains committed to pursuing all possible opportunities for deeper energy savings throughout its service area and will continue to solicit projects from customers to drive rebate participation for promoting sustainable, efficient natural gas consumption through its energy efficiency incentive programs.

Table A represents the Company's CY 2017 Energy Efficiency Incentive Program achievements, excluding the Low-Income Weatherization program. The Residential program exceeded the Commercial program's therm savings for the first time. Historically, the Company has attributed a larger amount of therm savings to the C/I program than to the Residential as C/I projects typically have larger savings per application than the Residential program. In addition, it is the first year the Residential programs rebates have passed the $1 million mark.

Table B represents the total program expenditures for incentives and programmatic delivery and/or administrative costs associated with delivering the Company's Washington energy-efficiency programs.

Table B: 2017 Residential/Commercial Programmatic Expenditures and Rebates Paid

	Incentives Paid	Programmatic Expenditures	Totals
Residential	$1,128,622	$648,231	$1,776,852
Commercial	$514,935	$899,512	$1,414,447
Low Income	$165,935	$13,537	$179,472
			$3,370,771
	Direct Benefit to Customers (DBtC)*	**Program Delivery**	**Total Program Costs**
Program Expense Comparison	$1,874,945	$1,495,826	**$3,370,771**
Program Expenditure Ratio	**56%**	**44%**	
NEEA Gas Market Transformation			$313,124
Residential Software Implementation			$43,990

*Note DBtC includes all rebates paid through the Residential, Commercial/Industrial and Low-Income program in addition to some expenses recorded under the "programmatic expenditures category" like bonus coupon payments to customers, quality control inspections and partnership agreements with community organizations working directly with customers to assist with rebate eligibility and installation.

Costs associated with the Northwest Energy Efficiency Alliance (NEEA) Gas Market Transformation efforts and one-time software implementation costs have been separated out from general programmatic expenditures for the purposes of assessing program cost-effectiveness for CY 2017. A second calculation in *UG-152286, CNGC 2017 Conservation Annual Rpt WP-1, 5.31.18.xlsx* can be viewed to assess cost-effectiveness of the program portfolio including the software implementation fees and the NEEA Gas Market Transformation Collaborative expenses for the third year of the Company's involvement in the five-year pilot. Note - expenses associated with the NEEA Collaborative effort will increase throughout the five-year pilot.

The Company has added a Direct Benefit to Customer (DBtC) ratio to the annual report per recommendations from Commission Staff under Docket UG-161253 with a target of 60% expenses being attributed as a direct customer benefit. Initial estimates of DBtC per the 2017 Conservation Plan were 57% of total program costs. This included a significant budget for Bonus Coupon offerings to customers through Trade Allies. Unfortunately, fewer funds were expended than expected under this budgeted category. Additionally, the underperformance of the Commercial/Industrial program has affected the ratio. The Company has since increased its incentives to customers as of June 30, 2017 and augmented the focus on Trade Ally coordination which will result in higher direct benefits to customers in next year's annual report. Additionally, the size of the Residential queue of projects submitted at the end of 2017 was significant indicating an opportunity to increase resources to accommodate the increased program uptake. This also accounts for the ratio of projects processed in CY 2017 experiencing a 2/3 ratio of pre-tariff vs post tariff measures based on install date.

Current Year Highlights

Some CY 2017 noteworthy highlights are provided in the following section for both the Residential and Commercial/Industrial programs.

Residential

Of note, the program experienced major growth in ceiling and attic insulation projects along with a noteworthy increase in whole home Residential air sealing thanks to the bundle mechanisms. Furnaces continued as the most popular Residential measure, following its mature adoption curve. Cascade's Residential Energy Efficiency Incentive Program again experienced growth in the Built Green measure's uptake due to targeted builder outreach, development of a new more efficient application process and partnership with local Home Builder Associations, thus encouraging a whole home approach toward efficiency in the new home industry. As a result of these efforts applications from builders grew six-fold. Finally, the success of the Tankless Hot Water Heaters should be noted as it moves up its adoption curve accordingly, doubling uptake from the previous year.

Table C: Residential Program Highlights

Existing Home Measures	**2016**	**2017**	**Participant Growth**	**Sqft Growth**	**2016 Sqft**	**2017 Sqft**
Ceiling or Attic Insulation	**165**	**1,026**	**522%**	112%	193,728	409,898
Floor Insulation	**163**	**202**	**24%**	36%	174,018	235,984
Wall Insulation	**62**	**85**	**37%**	19%	58,415	69,379
Whole House Residential Air Sealing	**3**	**158**	**5167%**			

New Home Measures	**2016**	**2017**	**Participant Growth**
Built Green Certified	**38**	**92**	**142%**
Energy Star Certified	**2**	**5**	**150%**

Full Residential Program Measures	**2016**	**2017**	**Participant Growth**
Condensing High-Efficiency Tankless Water Heater	**150**	**293**	**95%**
Conventional High-Efficiency Water Heater	**19**	**21**	**11%**
Energy Savings Kits	**81**	**175**	**116%**
High-Efficiency Combination Domestic Hot Water & Hydronic Space Heating	**29**	**26**	**-10%**
High-Efficiency Exterior Entry Door	**7**	**25**	**257%**
High-Efficiency Natural Gas Furnace	**976**	**1,556**	**59%**
High-Efficiency Natural Gas Hearth	**68**	**73**	**7%**
Programmable Thermostat	**-**	**292**	***New measure***

Commercial

The Commercial program highlights vary slightly from the Residential as it's pertinent to review both the measure increases and the unit increases due to the smaller number of C/I participants than seen in the Residential program. For instance, there were fewer furnaces installed in 2017, but these furnaces equated to an increase of 162 percent in therm savings over those attributed to 2016 due to the increased kBtu/hr. Domestic tankless water heaters experienced a significant increase in both number of units installed and therm savings. Additionally, both roof and wall insulation experienced an increase in participation, with

square feet of insulation installed increasing from 920 in 2016 to 49,079 in 2017 equating to a significant improvement.

Table D: Commercial Program Highlights

Standard Measures	Measures		Uptake 2017	Units		Therm Increase 2017
	2016	2017		2016	2017	
Warm Air Furnace	37	26	-30%	3,386	8,861	162%
Domestic Hot Water Tanks	36	31	-14%	8,879	14,324	61%
DHW Tankless Water Heater	2	15	650%	10	92	809%
Insulation-Roof	2	5	150%	46,470	92,182	98%
Wall Insulation	1	9	800%	920	49,079	5235%
Motion Control Faucet	1	3	200%	8	47	488%
Gas Convection Oven	6	9	50%	12	15	25%

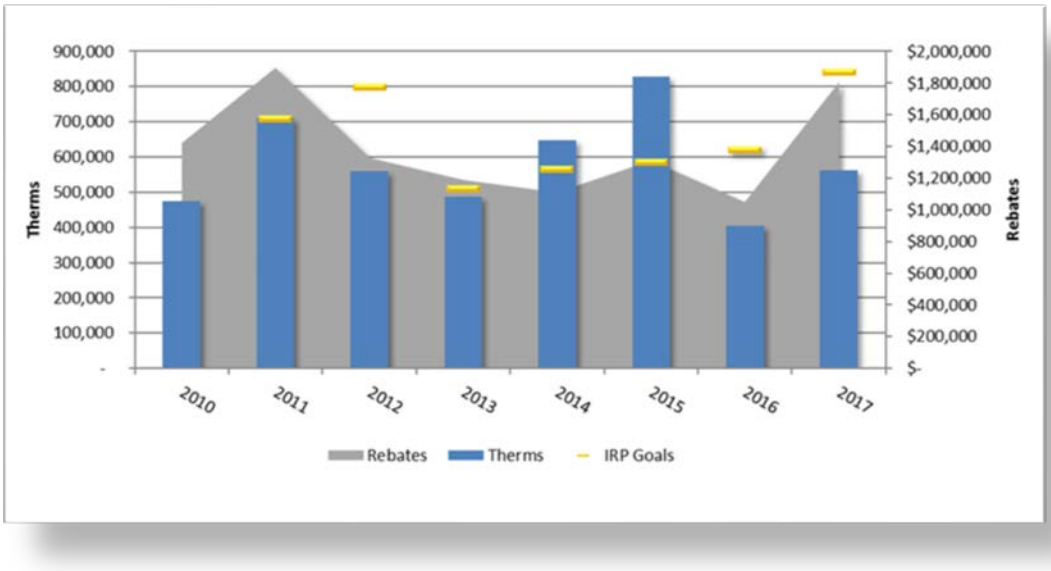
Cumulative Savings – Overview of the larger impact

This decade, Cascade's Energy Efficiency Incentive Programs have saved a total of 4.7 million therms, which equates to 24,782 metric tons of Carbon Dioxide Equivalent. This can be likened to either:

- GHG emissions from 60,739,153 miles driven by an average passenger vehicle
- CO2 emissions from:
  - 2,788,520 gallons of gasoline consumed
  - 27,113,320 pounds coal burned
  - 3,714 homes' electricity use for one year
  - 57,375 barrels of oil consumed

See Figure A for a visual of the therm savings for the past five years.

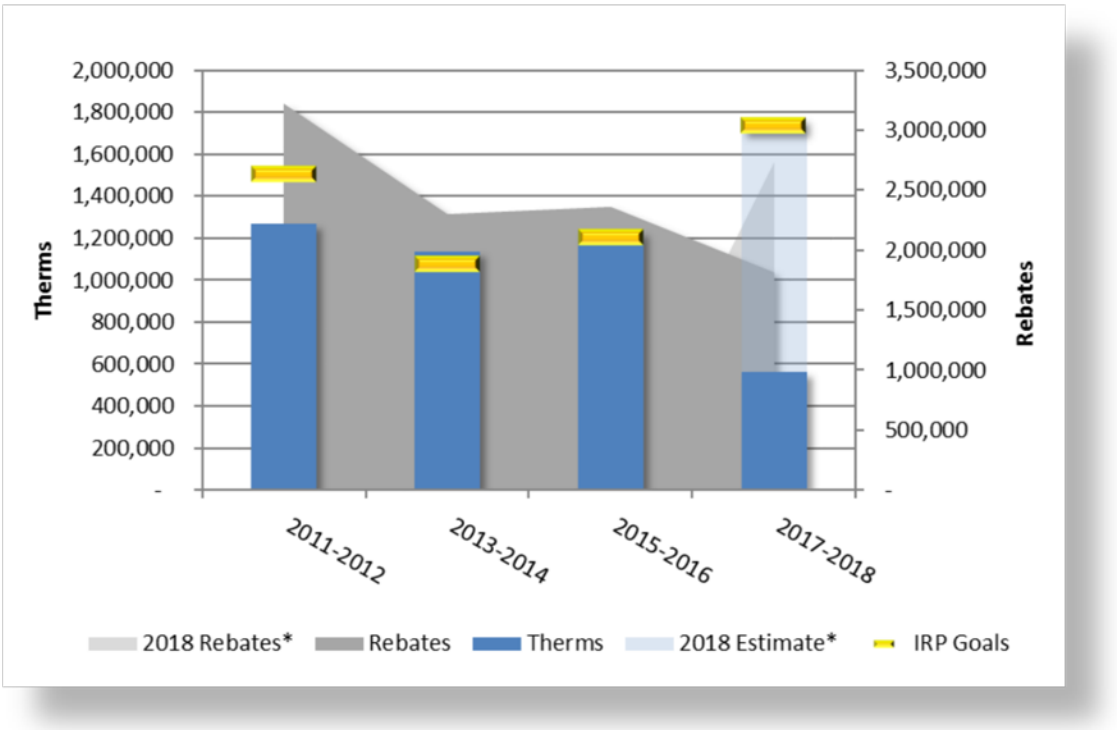
Figure A: Historical Portfolio Therm Savings, Rebates and Goals



Viewed as a 2-year accomplishment

Demand Side Management forecasting is provided in the Conservation Plan with a two-year time horizon. Figure B provides a brief summary of the two-year program achievements for Cascade's Energy Efficiency Incentive Program therm savings in line with the Plan's two-year focus. Please note CY 2018 is not completed so Figure B currently represents the bucket of therms that would be required should the Company reach a biennium target.

Figure B: Historical Biennium Portfolio Therm Savings, Rebates and Goals



*Note the 2017- 2018 biennium currently displays CY 2017 accomplishments with a CY 2018 placeholder.

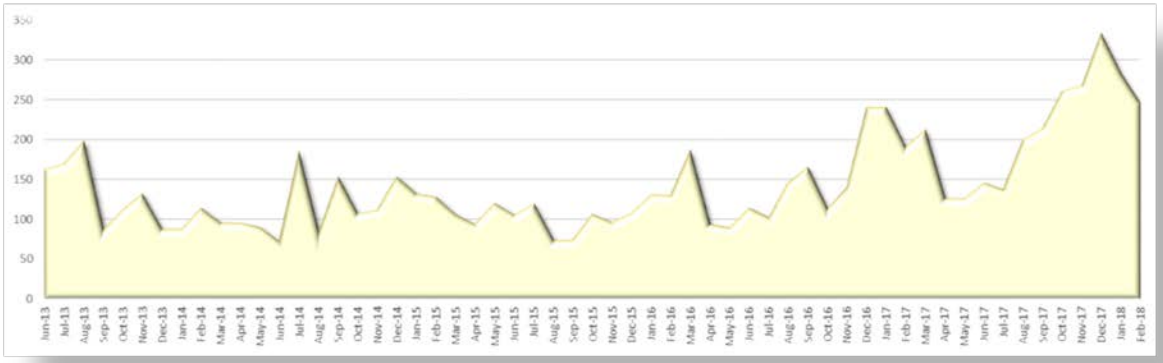
Reporting Format

Cascade records its Energy Efficiency Incentive Program annual performance based on the year in which the upgrade was paid by the Company as opposed to reporting based on the measure's install date. The Company does, however, record the install dates on rebate eligible upgrades. Prior to 2016 the Company solely tracked savings based on install date which frequently required review of claimed savings later in the year after the annual report was filed to fully capture savings for the previous year. This alteration in reporting format has had the beneficial side effect of reducing the need for a true-up of the previous year's report as it is less likely the Company will need to revisit the previous year's accomplishments to later include outlying applications. It has also allowed us to better gauge program accomplishments in real time and pivot efforts when needed.

Conversely, projects that were received in December of 2017 that previously would have been counted toward program achievements for CY 2017 based on install date, did not complete processing in the same month and will instead be attributed to 2018 program accomplishments based on paid dates. The Company experiences a significant uptick of submitted Residential rebate applications from late November, through January of the

following year. This influx of projects resulted in the Company having enough rebates in the processing queue to have reached the goals set for the 2017 Residential program if resources had permitted quicker processing. In fact, December of 2017 submitted applications reflected the highest number of applications received in a month for the past several years as was also demonstrated last year – see Figure C.

Figure C: Total Applications Received by Month



Low Income

Cascade has partnered with the Low-Income Weatherization Assistance Program (WAP) since 2008, offering rebates to the agencies delivering whole-home energy improvements to its customers in the State of Washington. Weatherization reduces the customer's energy burden by improving efficiency through upgrades to the building envelope and home-heating equipment. Whereas bill assistance addresses the immediate crisis, weatherization takes a long-term, sustainable approach by reducing the amount of energy needed to heat the home, thus supporting long-term affordability. It is therefore in the Company's interest to ensure as many low income natural gas homes receive weatherization services as possible within Cascade's service area.

Cascade appreciates the work performed by its partner agencies on behalf of its low-income customers. However, the Company maintains that there is still a great deal of untapped potential associated with Cascade's Weatherization Incentive Program (WIP) and Enhanced Weatherization Incentive Program (E-WIP). As shown below, therm savings and participation levels remain inconsistent, fluctuating significantly from year-to-year. The greatest fluctuations were observed during the ARRA years in which expanded federal funds were available. However, there were continued swings in the amount of savings achieved and dollars spent per home over time as demonstrated in previous annual reports. Variance can be even more pronounced from county to county. There are multiple factors contributing to these fluctuations.

First, the avoided cost of natural gas is not a constant. When rebate payments are tied to avoided costs (as they were prior to E-WIP), payments to agencies can raise or lower accordingly, thus increasing or decreasing the attractiveness of the program as a leveraging

resource. However, the agencies' TREAT (Targeted Retrofit Energy Analysis Tool) audit reports which were provided to Cascade as part of rebate processing documentation show minimum changes in measure payout, even considering declining gas costs. Thus, avoided costs may have had an impact, but not to a significant effect.

Another factor influencing participation is whether an agency has access to other funding sources in order to serve low income natural gas homes. This is because the WIP/E-WIP, like most utility programs, has served as a rebate program focused on fuel-specific measures. Funds are provided after work is completed, and it is assumed the agency has access to a primary funding source—namely categorical grant funds from the Department of Energy's Low-Income Weatherization Assistance Program. However, with continued declines in Federal funding, the Company has received increased requests for expanded program funding, suggesting that the agencies may be seeking alternative funding sources to maintain program operations. Agencies now require greater discretionary flexibility of alternative funding, and greater leveraged funding in general.

The capacity of low-income agencies to provide weatherization services to low income households, and prioritization of leveraged funds, is also a major factor in whether homes will be served. Since the onset of the program, the Company has observed that some agencies have been active in weatherizing natural gas homes in Cascade's service area via the WIP and E-WIP programs, while others have had minimal interaction. This does not necessarily mean natural gas homes are not receiving weatherization services, but rather that some agencies have not reported homes served to Cascade, nor sought the rebates from Cascade to which they are entitled, thus leaving essential weatherization funds on the table.

Cascade has not traditionally had access to consistent data regarding how many homes have been served independently of the WIP/E-WIP programs, however, data provided by The Energy Project to the Company's CAG has suggested this number is potentially substantial with some agencies forgoing the leveraged rebate funds from Cascade to which they were entitled. The Company is concerned by this finding, and strongly encourages all agencies to notify the Company when weatherization work has been performed within natural gas homes in its service territories, so these monies can be directed to serving an even greater number of customers in need.

Table E: Weatherization Incentive Program Participation Levels and Savings by Year

Year	Number of Homes Served	Therms Saved
2008	46	13,985
2009	54	14,733
2010	112	30,809
2011	84	24,130
2012	64	21,824
2013	38	14,960
2014	21	7,338
2015	19	11,724
2016	24	11,743
2017	27	5,564

Table F: 2017 Low Income Programmatic Achievements

Totals	Low Income
Therms Achieved	**5,564**
Measures Installed	108
Customers Served	27
Carbon Offset (metric tons of CO_{2e} Avoided)	29.5

Table G: 2017 Low Income Programmatic Costs

*Total Costs**	Low Income
Incentives Paid at $10k per project cap	$165,935
Health & Safety Repairs	$3,931
Audit Fee	$14,850
Inspection Fee	$8,100
Programmatic Costs	$13,237

**Please note totals rounded to the nearest dollar. The Low-Income program does not fall under the same cost-effectiveness criteria as the rest of the portfolio, and while both the Utility Cost and Total Resource Cost are provided in UG-152286, CNGC 2017 Conservation Annual Rpt WP-4, 5.31.18.xlsx, they are not included in the full portfolio cost effectiveness calculation.*

In 2017, the Company experienced a small increase in the number of homes served, reaching **27**. However, the number of therms saved decreased to **5,564**, the lowest number since the inception of the program, while average payment has nearly doubled since the previous year due to increased funding authorized through the E-WIP program. This may be in part due to the expanded portfolio of measures and increased focus by agencies on measures with lower

Company-recognized deemed therm savings, and higher associated installation costs, such as air infiltration reduction, floor insulation, and duct insulation which all had higher cost-per-therm values as indicated in this report. These measures were also installed at a higher rate than other rebate offerings.

Revisions to the Company's WIP in 2017 included:

- Expansion of the list of qualified energy efficiency measures to align more closely with the Washington State Department of Commerce's Weatherization Priority List.

- Increased rebate payments to cover the total installed cost of approved measures. Payments per dwelling were capped at $10,000 to manage program costs.

- Adding a $550 audit reimbursement and $300 inspection payment.

- Requirement for Agencies to execute a memorandum of understanding that defines their role as program administrators and establishes annual performance targets.

Expanded rebate offerings included:

- Water heater insulation
- Low-flow faucet aerators
- Low-flow showerheads
- Natural gas furnaces (95% AFUE or greater)
- Furnace tune-up and filter replacement
- Direct vent space heater (90% AFUE or greater)
- Natural gas water heaters (0.91 EF or greater tankless)
- Natural gas water heaters (0.64 EF or greater storage)

A provision was also added that agencies must identify a savings-to-investment ratio of 1.0 or greater under TREAT or the Washington Department of Commerce Weatherization Priority List in order to receive an incentive. To receive a rebate, an Agency must provide Cascade with documentation demonstrating the measure is cost effective under the appropriate climate zone and housing type under the Priority List or that it has a savings-to-investment (SIR) ratio of 1.0 or higher when modeled in the Agency's TREAT energy audit software.

The Company's weatherization tariff was also expanded to include an *Enhanced* Weatherization Incentive Program (E-WIP). The avoided cost of natural gas is still provided for all tariff-approved measures under WIP, and the total installed cost of each measure can be provided under E-WIP. Projects are also allocated up to $500 for health and safety repairs. Total project costs may not exceed $10,000.

Cascade is in process of potential program revisions resulting from its more recent rate case, and will continue to work with its CAG, agencies, and other stakeholders to identify and ameliorate the root causes of limited program participation. It's important to recognize a successful utility-run weatherization program cannot be achieved in isolation. Program

success instead requires both a well-designed program *and* factors beyond the Company's direct control. This includes having a fully articulated weatherization department in the serving low-income agency; the willingness/ability of agencies to prioritize natural gas homes; and the proliferation of program rules compatible with serving natural gas households.

Goal Setting

As previously mentioned the Company's platform for goal setting is housed within the Conservation Plan. This Annual Report is, however, a good opportunity to delve into some of the factors that can affect whether the Company is able to reach and exceed the goals set through its modeling software. As mentioned previously, Cascade used the TEA-Pot modeling tool provided by Nexant, Inc for 2017 program planning. Portfolios were shaped by the Company based on the TEA-Pot model and are periodically reevaluated and updated to balance cost-effectiveness (in keeping with current avoided costs), participation outcomes and updated building codes. The Company also confers with its CAG as appropriate when alterations to the program portfolios are planned and implemented.

In 2013, Cascade hired Nexant, Inc. to produce a Conservation Potential Assessment, which included a tool for modeling future programs' potential therm savings. The Technical, Economic, Achievable Potential model (TEA-Pot) was delivered in February 2014 for use in the Demand Side Management chapter of the Integrated Resource Plan (IRP) in accordance with the Company's internal program design planning and construction.

In the last full run of the model, Cascade included potential based on various incentive levels in order to gain clearer insight into ways to grow the program and maximize therm savings potential, while sending an enticing price signal to the end user to engage in energy-efficiency practices. The Company also incorporated the administrative costs into the model rather than taking the results down by a certain percent to mimic the perceived potential effect of admin costs. The ability added by Nexant to the TEA-Pot model for incorporation of the admin per therm directly into the forecast calculations greatly increased the efficacy of the targets and produced a sizeable increase in potential above past years' performances. In light of the increase in goals, Cascade remains committed to achieving as many therms saved, as efficiently as possible, for its customers using all available assets.

As of Q2 2018, the Company now has an updated Conservation Potential Assessment and new tool to replace the TEA-Pot model as the end use planning software for the 2018 DSM portion of the IRP cycle, LoadMAP. One of the primary benefits of the new tool is its ability to run the forecast based on a methodology consistent with the Northwest Power and Conservation Council's Seventh Conservation and Electric Power Plan[2]. "This includes

[2] "Seventh Northwest Conservation and Electric Power Plan." Northwest Power & Conservation Council, February 10, 2016. http://www.nwcouncil.org/energy/powerplan/7/plan/

estimated technical, achievable technical, then achievable economic potential using the Council's ramp rates as the starting point for all achievability assumptions."[3].

It is relevant to note the achievable level of potential identified by any model is unable to fully account for all possible reasons a customer would not apply for, or qualify for, a rebate. At a program specific level, there are instances where customers install higher-efficiency upgrades, but choose not to notify the Company of the install and do not complete an application. Alternatively, some customers take the step to apply but do not qualify for the rebate due to lack of documentation, late submission of an application or a general misunderstanding of program requirements (including rules around using licensed contractors versus self-installs). As part of the Company's efforts to increase customer participation and satisfaction, the Company continues to remove barriers to successful rebate submittal and increase customer satisfaction which is discussed in the following section. In this light the Company has identified significant dissatisfaction from customers who utilize both a heat pump and a natural gas furnace. At this point and time, the duel fuel use negates the Company providing a rebate for the furnace based on deemed therm savings as a backup heating option which has resulted in disqualifications. The Company will further review this barrier in the next year based on input from the CPA and explore opportunities to incentivize these customers if viable.

Program Evaluations

The Company has continued to actively evaluate and improve its EE programs throughout 2017. Many of these processes were put in place in 2016 as part of the Residential program transition to inhouse implementation, and the Company has continued to progress on these process improvements with an eye to refining the customer experience while expanding outreach through increased incentive offerings and higher savings goals. The following areas were evaluated, addressed and rectified:

Coaching, support and education to Trade Allies (TAs) on Cascade's EE Program requirements:

- When the Company took over internal implementation of the Residential EE program a large percentage of applications had previously been disqualified by the vendor due to missing information. At this point the program is experiencing fewer than 6% of denied submissions due to internal evaluation and coordination with Trade Allies
- The Company has identified potential for residential and commercial Point of Sale rebates and is continuing to review parameters around which these could be offered by Trade Allies, while maintaining the integrity of the programs
- Increased emphasis on matching fund availability for blower door and air sealing training to encourage whole home approach and rebate submittals
- Automated Good Form and Bonus Coupon monthly activity reports for TAs
- 30-day automated alerts to TAs for upcoming insurance and license expirations

[3] "2017 Cascade Natural Gas Conservation Potential Assessment" AEG, Applied Energy Group, March 16, 2018.

- Added internal resources to increase Eastern Washington Trade Ally outreach, providing a local point of contact and increasing frequency of program check-ins

Quality Analysis allowed streamlining of rebate processing steps:

- Analyzed processing timeframes and moved bottleneck from Management Authorization for Payment to Active status data entry
- Identified cyclical nature of the program and increased capacity requirement during winter months
- Authorization for Payment process improvement – reduced 12 -16 hours per week on backend payment processing (through improved automation)
    - Technical software reconfiguration – implemented by the software vendor
    - Implemented additional security for remote authorization – through CNGC Accounts Payable guidance
    - Eliminated and minimized email approval download lag time
    - Standardized approval format to eliminate individual signatures
- Analyzed and improved missing information tracking and follow up:
    - Removed required fields in the Missing Information Form in Demand Side Management Central (DSMC) software that required excessive load times which had reduced the rate of application processing
    - Missing Information tracking log implemented to keep projects on a schedule for follow-up requests.
        - Set parameters around denying applications when customers did not provide sufficient information to process, including exceeding three months of unresponsiveness or three separate contacts.
            - This resulted in follow-up requests being "fresher", yielding better responses, and makes it easier to identify recurring issues to escalate to the TA coordinator for future improvement

Initial foray into Residential customer energy-efficiency financing options and potential for inclusion into the CNGC programs.

- The EE Department explored options and recommendations from other Departments within the Company on viability of implementing internal financing on customer bills
    - This identified alternative financing routes that were already available to customers which indicated there was not currently a need to increase admin expenses to duplicate efforts when existing partnerships could be leveraged
    - In addition, implementing a Point of Sale pilot with interested TAs was found to have a greater potential to increase program participation

Increased focus and research into builder-centric outreach and assistance to encourage whole-home energy-efficiency upgrades:

- Builder incentive checks are now sent directly to the internal coordinator for final quality check

- Increased number of builder rebates six-fold between CY 2017 over CY 2016
- A new builder database and redesigned application were deployed to decrease obstacles associated with submission of multiple projects at once and improve builder's program participation experiences.

Evaluation of language barriers in the Company's service territory for the Latino community resulting in development of Spanish speaking pieces and internal energy efficiency staff accommodating Spanish speaking customer requests:

- Hispanic outreach; web update: translated and published applications and incentives for all programs

Feasibility Workbook district coordination combined with Major Account Management to allow movement upstream in the decision-making process for equipment selection

- Worked with Company regional directors to increase support of the EE programs from the Districts, allowing greater outreach earlier in the process for customers starting or updating their gas service
- Reconfigured the Feasibility Workbook, which is the form used by district personnel when altering or starting service for a customer to include an "opt-in" follow-up option for energy efficiency outreach
- This process was newly implemented and coordinated through 2017 into 2018 with Q1 demonstrating follow-up for 80 residential customers, 11 builders and 26 commercial accounts to customers who had explicitly noted interest in EE programs

Customer rebate processing

In CY 2017 the Energy Efficiency program's quality management continued to mature even as volume doubled

- Documented process for handling incoming paper and fax applications to expedite and standardize while reducing and preventing loss applications
- Implemented additional support for phone coverage during payment processing timeframes to expedite and reduce errors
- In support of error-free payment processing, implemented significant cross-training to develop a deep bench and prevent processing bottlenecks whenever feasible and resources allowed
- Evaluated all tracked data and altered tracking format where viable to improve processing times
    - Example includes altering to a Y/N data entry for whether equipment serial number is shown on invoice with the serial number still tracked on the invoices themselves, but not required to input for processing rebate, with the exception of valid duplicate measure installs
- Streamlined Tier 2 reviews: from documenting the rebate number of each project approved in emails to updating to a 50 percent sampling process for Tier 2 reviews
- Instituted corrective action tracking and root cause analysis procedure

    - Primary example thus far includes increased focus on Bonus coupon tracking
- Added Payee name column to Authorization for Payment record for quality control

Software Applicability and Customization

Created DSMC directory database to handle new rebates in the queue status eM&V[4] (evaluation, Measurement and Verification):

- Although Nexant purportedly had in-house DMSC expertise on EM&V, Cascade has had to build the program functionality for Nexant; which they have subsequently marketed to other NW utilities.
    - These collaborative efforts with the vendor have an aim toward accommodating weather normalized project eM&V for participating Residential projects
- Cascade continues to work with Nexant to finalize and implement the eM&V functionality and tracking of projects and deemed vs actual savings within their software.
- Low Income Weatherization program was brought on-line for Company tracking and entry which has resulted in significant improvement in invoice approval process time with agency entry planned for later in 2018

Miscellaneous

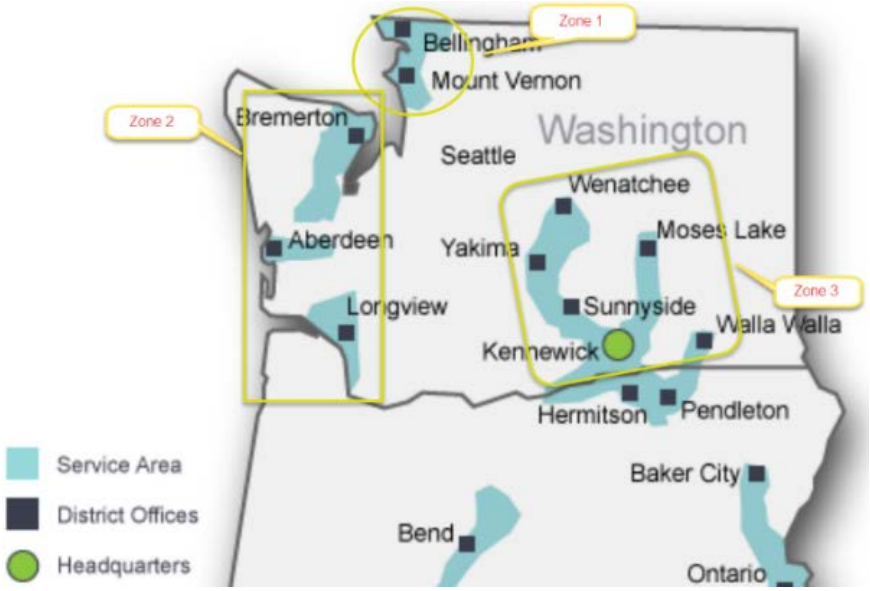
- As part of the commitment by the Company to perform the Request for Proposal for the CPA, internal staff performed a risk analysis prior to implementation to evaluate potential issues and pre-plan their resolutions
- The EE Department spent significant time evaluating the Conservation Corner microsite looking for ways to incorporate some best practices and improve the customer experience, resulting in a microsite redesign proposal

Quality Control Inspections

The Company also performed Quality Control inspections on both Commercial/Industrial projects and Residential projects. All C&I projects over $5,000 had quality control inspections performed, and historically up to 5% of applications submitted for the Residential rebate program were assigned quality control inspections. In 2017's Residential program, 17 inspections were performed in Climate Zone 1 (Northwest portion of the Company's service territory), 19 in Zone 2 (Western/Coastal region) and 113 in Zone 3 (East of the Cascade Mountains). See **Figure D** for key towns located within Cascade's three Climate Zones. These projects consisted of a combination of randomly selected and flagged Residential submissions.

[4] Note, eM&V is the Company's naming convention used to differentiate internal ongoing program evaluation, Measurement and Verification tasks and processes from formal third-party EM&V performed as part of a contract. It is intended as an interim process between third-party EM&V cycles.

Figure D: Cascade Energy Efficiency Washington Climate Zones



All Commercial inspections are performed by the Company's C&I vendor as part of their program delivery. The C&I inspection includes one of four elements - either a pre-installation, post-installation, study review and/or general project review. The Reviewer verifies all measures listed on the application have been installed, are operational, meet the program requirements, include start up reports and invoices and often include photos of the installed equipment for verification and proof of install at qualifying locations. The reviewer then confirms their approval and signs and dates the form.

The Residential program inspections are performed through a combination of internal staff review and third party contracting through the Sustainable Living Center located out of Walla Walla Washington. Table H provides a breakdown of the number of Residential inspections performed in 2017 per climate zone.

Table H: Residential Program 2017 Inspection Summary

Climate Zone	QC performed
Zone 1	**17**
Zone 2	**19**
Zone 3	**113**
Total	**149**

The Residential inspections are geared toward confirming the submitted applications match those measures actually installed including meeting minimum efficiency requirements, that all pertinent health and safety requirements have been addressed, and that generally accepted industry best practices have been demonstrated as part of the installation by a contractor. The program verifies the reported efficiency of the equipment as well as the R-values and U-factors on weatherization projects to confirm deemed savings are viable for those projects. If

an issue is noted as part of an inspection the customer and contractor are notified of the issue and in most cases given an opportunity to address and correct. Cascade also uses quality control inspections as a means to confirm the quality of installations performed by Trade Ally contractors to the program as well as vet contractors seeking admittance to the program.

The following demonstrate some of the issues addressed as part of the inspection process in 2017:

- As indicated in Table H, Zone 3 (Cascade's Washington service territory east of the Cascades) experienced significantly more quality control inspections than the other two zones, exceeding the standard 5% inspection rate. This was a result of an active contractor working to upgrade customer homes with additional attic insulation while performing air sealing. The improved rebate amounts, which went into effect June 30, 2017, prompted this contractor to increase his outreach and production in the Company's Yakima District territory. As the Company wanted to increase uptake while maintaining program integrity and customer satisfaction, it implemented a more comprehensive and aggressive quality control inspection process for projects submitted by this contractor to confirm all program requirements were met and were not sacrificed as a result of the increase in production. This contractor's efforts contributed to a substantial increase in attic insulation and air sealing accomplishments and will be further demonstrated in the 2018 program accomplishments. It is also important to note this effort required a substantial amount of administrative time and assistance from the Company to accommodate; thus support was far in excess of typical Trade Ally interactions.

- The Company has augmented its outreach and coordination with builders to increase builder uptake of program offerings. As part of this effort, the Company coordinated with a local builder to inspect a number of recently completed homes to confirm program requirements are being met. It can be difficult to schedule inspections on new homes as the individual applying for the rebate is frequently the builder, but the applications are often not submitted until the new owner has taken possession of the property, making scheduling inspections a difficult proposition. In this case, the Company worked with the builder to inspect properties that included a natural gas furnace install and were not yet occupied. Overall, 7 inspections were performed and passed supporting identical model numbers and gas furnaces for this housing complex.

- The Company has recognized customers frequently apply for conventional water heaters that do not meet the minimum efficiency requirements for an incentive through the program. In one instance a customer sent in an application along with an invoice for a water heater that did not include the model number, so the application was chosen for inspection to obtain the model number and determine eligibility. During the inspection the customer informed the Company that the higher efficiency model was selected because it had a better warranty than the lower efficiency model, 12 years versus 6 years. Anecdotal evidence obtained during customer interactions of this nature allows the program to better understand availability of equipment

within its service territory and help ascertain barriers and additional motivations to encourage others to install high-efficiency qualifying measures as part of their home improvements.

Participation Summary

A full breakdown of therm savings, Utility Costs and Total Resource Costs by all measures and programs for the 2017 program year can be found within the files filed in addition to this report with the commission:

- *UG-152286, CNGC 2017 Conservation Annual Rpt WP-1, 5.31.18.xlsx* - This first work paper provides the cost effectiveness calculations for the entire portfolio.
- *UG-152286, CNGC 2017 Conservation Annual Rpt WP-2, 5.31.18.xlsx* - This second work paper provides the cost effectiveness calculation for the Commercial program.
- *UG-152286, CNGC 2017 Conservation Annual Rpt WP-3, 5.31.18.xlsx* - This third work paper provides the cost effectiveness calculation for the Residential program.
- *UG-152286, CNGC 2017 Conservation Annual Rpt WP-4, 5.31.18.xlsx* - This fourth work paper provides the cost effectiveness calculation for the Low-Income Weatherization program.

Updates to CY16 Program Achievements

Cascade has not included a true-up of the Company's previous year's report as no additional expenditures or rebates were submitted after the report was filed. This is due in large part to the Company reporting savings by paid vs install date.