CASCADE NATURAL GAS CORPORATION®

A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

2018 Washington Conservation Plan

Table of Contents

Introduction

Cascade Natural Gas Corporation has developed this Conservation Plan in consultation with its Conservation Advisory Group (CAG) as a roadmap to the 2018 and 2019 near term conservation strategy for reducing consumption through its Energy Efficiency Programs.

This third iteration of the Conservation Plan is intended as a companion planning document to the Demand Side Management (DSM) chapter of the Company's Integrated Resource Plan (IRP). The following program elements can be referenced between the two documents as follows:

1) An executive summary of the potential forecasting of the Company's energy-efficiency efforts remains in the Demand Side Management (DSM) chapter of the IRP. 2) General discussion around DSM including environmental externalities, regional energy planning and legislative impacts have also remained a part of the IRP. In addition, the Conservation Plan places its focus on potential and near-term conservation program planning (under a 10-year umbrella) versus the longer term 20-year outlook inherent in the IRP. The next iteration of the IRP (2018 IRP) will also house the 2017/2018 Conservation Potential Assessment performed by Applied Energy Group (AEG) with a scheduled completion date in February of 2018.

The Company's Conservation Plan, encompassed here, will discuss the potential savings determined for the Cascade Natural Gas Corporation (CNGC) Washington service territory through the Company's TEA-Pot (**T**echnical **E**conomic **A**chievable **Pot**ential) modeling tool provided by Nexant Inc. To parallel the format of Conservation Plans provided by other utilities in Washington State, this document will demonstrate the Company's immediate (two year) conservation goals as well as the 10-year forecast of savings.

The Company approached the 2017 Calendar Year as an opportunity to refine its mature program by further incorporating improvements introduced in 2016. Updated elements to the Conservation Incentive Program (CIP) included enhancements to program reporting, increased transparency in potential planning, strategic process development and tracking and implementation of software to support in-house residential rebate processing activities. The Company also implemented a companion software platform to improve management of the Trade Ally network. This significant evolution in the Company's approach to residential program delivery allowed CNGC to better control the customer experience throughout the rebate process, while providing greater insight into areas of opportunity for further penetration of the Conservation program throughout its Washington territory. The Company is now able to tailor its reporting and tracking to more succinctly influence and adapt to program strategy. Calendar year 2018 will provide CNGC with an even better understanding of Conservation Potential available throughout its territory while enabling the Company to learn from, and incorporate,

some of the best practices of its peers throughout the Northwest Region. CNGC has committed to transitioning its Energy Efficiency efforts to a more agile and regionally focused program delivery method. Reportability of program accomplishments, improved data analytics, real-time insight into program development and a commitment to coordinating with regional partners are key motivators for the next year.

Overview

Demand Side Management refers to resources acquired through the reduction of natural gas consumption due to increases in efficiency of energy use and/or load management. Unlike supply side resources, which are purchased directly from a supplier, demand side resources are purchased from individual customers in the form of energy that remains unused as the result of energy efficiency. The Washington Utility and Transportation Commission requires gas utilities to consider cost-effective DSM resources in their energy portfolio on an equal and comparable basis with supply side resources. In the gas industry, DSM resources are conservation measures that include, but are not limited to ceiling, wall and floor insulation, higher efficiency gas appliances, insulated doors, ventilation heat recovery systems and weather stripping. By incenting customers to reduce their demand for gas, Cascade can displace the need to purchase additional gas supplies, displace or delay contracting for incremental pipeline capacity, and possibly displace or delay the need for reinforcements on the Company's distribution system. It's also important to acknowledge that although the Company can prompt and encourage customers to reduce their use, in due course it's up to the end user to act and recognize the values inherent in energy efficiency. Ideally, the result is a reduction in consumption and increased load management stimulated by Company messaging and incentives.

There are two basic types of demand side resources: baseload resources and heat sensitive resources. Baseload resources displace the need for baseload supply-side resources. They will offset gas supply requirements throughout the year, regardless of the weather and outside conditions. Baseload DSM resources include equipment like high efficiency water heaters, higher efficiency cooking equipment and Ozone Injection laundry systems. Heating load sensitive DSM resources are measures whose therm savings increase during cold weather (meaning the measure is used more often during colder weather). For example, a high efficiency furnace will lower therm usage in the winter months when the furnace is utilized the most and will provide little if any savings in the summer months when the furnace is rarely used. Examples of heating load sensitive measures include ceiling, floor, and wall insulation measures, high efficiency gas furnaces, and improvements to ducts and air sealing. These types of heat sensitive measures offset more of the peaking or seasonal gas supply resources, which are typically more expensive than baseload supplies.

Program Goals & Budgets– at a glance 2018 & 2019

Table 1
CIP Goals 2018 & 2019

	Calendar Year 2018				Calendar Year 2019			
	Residential	Commercial Industrial	Low Income[3]	Total	Residential	Commercial Industrial	Low Income[3]	Total
Administrative Budget[1]	$566,500	$1,250,000	$6,000	$1,822,500	$583,495	$1,287,500	$8,400	$1,879,395
Therm Targets[2]	238,627	377,640	5,000	616,267	246,299	396,712	10,000	643,011
NEEA Natural Gas Market Transformation				$452,285				$548,803

[1.] *Note budgets in this table are estimates and are referring to administrative budgets for program implementation, not rebate payments to customers.*
[2.] *Therm targets from this graph have been developed through the TEA-Pot modeling tool inclusive of administrative costs. Calendar Year 2019 targets will be revised in mid-2018, and through the 2019 Conservation Plan as part of the new Conservation Potential Assessment and upcoming LoadMAP modeling tool which the Company should have access to after the first quarter of the year.*
[3] *Low income targets are included within the Residential forecasts*

For reference, the Company has provided a comparison of the past three years of achieved overall savings contrasted with the IRP goals below. Please note 2017 achievements will be provided as part of the Company's Annual Conservation Report which is released on June 1 of the following calendar year and the number under 2017 "Actuals" is effective as of the time this plan is being drafted. It should also be noted 2014 IRP goals were not officially acknowledged by the WUTC.

Table 2
Historic Program Achievements compared to Goal

	Year	Goal	Actual	Difference
2014 IRP	2015	584,449	831,501	42%
	2016	620,020	393,814	(36%)
2016 IRP	2017	839,876	465,875*	Not yet available
	2018	891,574	Not yet available	Not yet available

*2017's final actuals are not yet available. This number is based on the year to date figures through the end of September, thus only the first three quarters of the year, and then extrapolated to provide what 2017 is tracking towards hitting by year end if therm savings continue to accumulate at the same rate. This is not the final nor official number for 2017.

Program Benefit Ratios in the 2018 Budget

In January of 2017 Staff from the Washington Utilities and Transportation Commission

(WUTC) engaged in a supplemental analysis of the budgeting allocations for natural gas utilities as an additional metric of program success. As part of this analysis the Company categorized its program expenditures under a ratio of direct benefit to customers (DBtC) compared to additional program expenses. The Company identified a 57% DBtC inherent in its 2017 budget and was asked in future years to aim for a minimum of 60% DBtC. Cascade has worked with its Conservation Advisory Group (CAG) and with Commission Staff to realign program rebates to account for a higher percentage of the program expenditures in the second half of 2017 and will continue into 2018 offering the increased rebates as a direct benefit to customers.

Per WUTC direction DBtC are to include customer incentives and rebates, payments to Community Action Agencies, and upstream incentives to energy program partners and Trade Allies. Based on this guidance the Cascade program expenses can be broken out in the following categories:

Table 3

Cascade Natural Gas - 2018 DBtC Category Clarifications		
	Direct Benefit Column	**Other Costs**
Residential	Rebate payments, Trade Ally bonus coupon allotments to go to customers for using a qualified TA, partnership with local energy programs promoting the programs by assisting customers to qualify and apply for rebates	Labor, Trade Ally program materials and cooperative marketing and training reimbursement as well as general TA outreach, residential Conservation Incentive Program ad placement, Software access fee, and a portion of Organizational dues, travel expenses associated with program delivery, seminar and training attendance and a portion of miscellaneous office supply and operating expenses
Non-residential	Rebate Payments and partnership with local energy programs promoting the incentives through customer engagement offering assistance while serving as a liaison between the customer and the utility	Third party program management inclusive of commercial marketing efforts, internal staffing & oversight and coordination from CNGC staff, a portion of Industry specific organizational dues (trade organizations for example), travel expenses for program delivery, seminar and training attendance and miscellaneous office supply and general operating expenses
Low income	Customer Rebates for Low Income weatherization services	Program staff administration

The Company will strive to reach this new metric of success as noted in the below DBtC table, yet notes there are certain elements of Cascade's territory which make a 60% ratio of benefits to costs difficult to maintain.

- The program has specific fixed costs associated with administering the incentives to customers. These costs are not affected by the amount of uptake or rebate submissions and are static.
- The customer rebate budgets are estimates, highly dependent on customer uptake and individual decisions from the consumer. The Company can encourage participation, but cannot force customers to engage in the efficiency efforts.
- The CNGC territory is relatively rural (compared to some of the other natural gas providers in Washington State) requiring additional administrative effort and funds to reach and impact the widespread territory.
- The Company is not a duel fuel provider so does not have the same opportunity to leverage existing efforts as can be found with some other utilities within the state.

Table 4

DBtC – Cascade Natural Gas 2018 Conservation Budget			
	Direct Benefit to Customers	Other Costs	Total Utility Costs
Residential	$1,583,459	$506,500	$2,089,959
Non-residential	$1,021,089	$1,250,000	$2,271,089
Low income	$190,000	$6,000	$196,000
NEEA	$452,285		$452,285
Total	$2,794,548	$1,762,500	$4,557,048
Portfolio Ratio	61%	39%	

*For gas programs, NEEA is excluded from the total budget at this time

The Company is providing the following 2018 detailed budget for reference and to clarify the elements included in the budget under the DBtC vs the administrative costs of the program.

Table 5

Program Budgets - Reflected in the 2018 CNGC Conservation Plan			
Incentive Estimates			
	Plan	**Details**	**Notes**
Residential	$1,523,459		
Commercial/Industrial	$1,021,089		
Low Income	$190,000		LI Based on 2017 achievements at $7,600 average per home
Total Incentives	**$2,734,548**		
Non-Incentive/Admin Expenses			
	Plan	**Details**	
Residential	$566,500		Includes staffing, marketing of the program, partnership with other utilities for program outreach
Commercial/Industrial	$1,250,000		Toward 3rd party program management inclusive of commercial marketing efforts, remainder toward internal management and program coordination. Note the increase in proposed third party delivery from 2017 budget is to accommodate an alternative Pay for Performance contract
Low Income	$6,000		Allocated toward labor
Program Portfolio Admin	**$1,822,500**		
Non-Incentive Expenses include:			
Labor	*$349,532*		Company staff admin - 65% allocated to residential/ 35% to commercial + LI program admin
Trade Ally/ Program Outreach	*$160,800*		$110, 000 (TA specific)
		$43,250	TA outreach/materials/coop & training reimbursement/management
		$60,000	Bonus coupons delivered by the contractors & increased allowance to accommodate additional Quality Control inspections (allocated as DBtC)
		$44,107	Residential Program marketing/ad placement/LI messaging
Third Party Program Management	*$1,080,000*		Includes 3rd party staffing/ and program outreach specific to the Commercial/industrial program for message placement (marketing), direct program outreach efforts and contractor coordination - increased from previous year, total dependent on vendor achieving goals
Annual Software fees	*$150,000*		Includes management of the physical residential rebate processing and TA program delivery/ tracking/communicating/ etc. - added additional maintenance and update support for 2018 to general operating expenses category
Other	$26,000		Organizational dues (Home builder's associations/ Built Green Associations/Industry associations like the Restaurant and or Lodging association/Food Processors, etc. / industry trade memberships)

	$5,500	Residential Program partnership agreements with local community energy programs who promote the CNGC programs like Sustainable Living Center & Community Energy Challenge
	$3,000	Toward partnership with local commercial energy program Sustainable Connections
	$20,759	Travel expenses associated with program outreach
	$7,400	Seminar attendance/training
	$32,952	Office supplies/general operating expenses/ updates to iDSM Central for Tariff changes
Excluded from DBtC		
NEEA Market Transformation	$452,285	Five Year Pilot
Nexant EM&V implementation costs	$10,000	Excluded per Staff direction from previous agreement as it is not a recurring expense - onetime fee to complete software implementation carryover from 2016
CPA - 2018	$70,000	A portion of the total Conservation Potential Assessment costs absorbed in 2017 and remainder will occur in 2018.
Total administrative	**$2,354,785**	
Combined Total	**$5,089,333**	

Program Cost Effectiveness

Conservation program offerings are affected by declines and increases in the costs of natural gas in the marketplace. A decrease in the cost of gas makes it difficult to maintain robust conservation programs as a utility, whereas gas price increases make conservation efforts more viable from a cost/benefit perspective. In light of these ongoing considerations, the Company continues its commitment to offering meaningful conservation programs to help drive customer decisions toward higher-efficiency appliances and upgrades. In CY 2013/2014 the Company had a fully customized Conservation Potential Assessment performed by Nexant Inc. which specifically included analysis on its potential from both the Total Resource Cost (TRC) test, and Utility Cost Test (UCT). While the Company had previously assessed program cost effectiveness under both tests, this was the first time the Company utilized both the TRC and UCT at the potential modeling phase of program development. This approach reflected guidance from the UG-121207 Conservation Policy Statement from the Washington Utility and Transportation Commission (WUTC), which stated program valuation under the UCT was acceptable in the absence of a fully refined and sophisticated TRC instrument. The Company held multiple discussions with its CAG related to the policy statement, and ultimately move towards the UCT as its primary valuation metric, with TRC as its secondary (both of which cost tests are included in the CY 2018 plan). This alteration allowed the Company to maintain its Washington programs despite fluctuations in the

cost of gas, while recognizing the value of the efforts from a utility provider's perspective of decreasing demand.

In an Addendum to the 2016 IRP Action Plan the Company committed to working in collaboration with the Conservation Advisory Group to evaluate moving towards using the TRC in its annual conservation plan and report. The company will incorporate the TRC in its revised model and as part of the CPA is analyzing the inclusion of the following – expected carbon policies, capacity (supply and distribution), monetized non-energy benefits and a conservation credit adder in addition to valuing the cost-effectiveness of the program through the UCT.

Using the Company's 2018 proposed budgets and goals the UCT benefit cost ratio is estimated on the portfolio level to be 1.7 and the TRC 1.6. These estimates assume the Company would achieve all goals. It is important to caveat the program's cost-effectiveness is dependent on individual customer actions and while the Company tries to influence customers, the actual cost-effectiveness is best measured once the program year has completed. Also note the current estimated TRC is based on an unbalanced and incomplete TRC analyses which is being addressed as part of an ongoing assessment study.

Docket UG-121207 Policy Statement on the Evaluation of the Cost-Effectiveness of Natural Gas Conservation Programs

The Policy statement, released in October 2013, provided the Company with guidance on evaluating the cost effectiveness of its natural gas conservation programs. As per the policy's guidelines the Company elected to utilize the UCT in consultation with its CAG. The use of the UCT, as opposed to sole use of the traditional TRC method, allows the Company to maintain a continued, robust conservation portfolio of measures.

Washington Utilities and Transportation Commission Docket UG-121207 offers guidance regarding the optimal method for the valuation of natural gas conservation efforts in the State of Washington. This document thoroughly addresses best practices for measuring cost-effectiveness as reflected in WUTC's guidance that: "[W]e are unwilling to allow utilities to end natural gas conservation programs as a result of an unbalanced or incomplete TRC analysis. Any TRC analysis without these values [conservation's risk reduction value, the downward price pressure from reduced demand, and non-energy benefits] is potentially biased against conservation programs. Accordingly, the UCT is an acceptable option when a properly balanced TRC is not available."[1]

[1] Washington Utilities and Transportation Docket UG-121207 – Policy Statement on the Evaluation of the Cost-Effectiveness of Natural Gas Conservation Programs pg. 14-15

The Policy statement also addressed the use of discount rates in cost-effectiveness calculations. The Company has worked closely with its CAG to determine the appropriate rate to use when calculating the net present value of its annual costs and benefits from the conservation programs. It was determined Cascade would initially use the long-term discount rate as had previously been used to enable the programs to remain in place at their existing levels and to prevent removal of a significant amount of measures due to a severe discounting scenario, as would have been the case had the Company utilized the Weighted Average Cost of Capital (WACC). As part of the Company's efforts to maintain consistency throughout its forecasting efforts and IRP documentation, the Company has transitioned to using the average 30 Year Mortgage Rate as the long-term discount rate – which will be reevaluated as part of the Company's IRP process. For the 2016 IRP, the long-term discount rate used was 3.52%.

Measure Updates

As the energy efficiency market continues to develop and cost-effective conservation technologies become increasingly available, the equipment standards and accessibility to such measures will evolve over time. In order to ensure the Company's DSM offerings stay current, Cascade engages in a regular review of the measure-mix within its conservation portfolio. Measures are added, removed, replaced, or modified when it is determined new technologies of equal or greater cost-effectiveness are available to the market. However, the emergence of a high-performance natural gas conservation technology will only have positive energy-savings impacts if customers are willing to pay the initial higher costs associated with the purchase and installation of cutting edge efficiency measures. Therefore, market transformation efforts are essential to increasing accessibility to purchasers while decreasing costs to the consumer. This paves the way for future higher-efficiency choices and actions. By monitoring and updating the measures and incentive levels within Cascade's Conservation Incentive Program (CIP), and amplifying the education and awareness outreach to customers, the Company can ensure ratepayers have access to an optimal level of behavior-motivating incentives and knowledge needed to encourage the purchase of cutting-edge, cost effective, gas conservation technologies with confidence they will result in increased efficiency. In conjunction with monitoring the viability of more "traditional" natural gas conservation measures, the Company engages in concurrent efforts to research and determine the feasibility of emerging high-efficiency gas technologies. The Company continues to monitor cutting edge measures and has made progress on this front thanks to the reassessment of the Company's conservation potential.

Emerging Technologies

The Company evaluates emerging technologies with strong potential for deeper natural

gas savings. Such high-performance measures include energy-efficient Natural Gas Heat Pumps (GHP) which have been identified as a promising and high-impact conservation measure by Oakridge National Laboratories.

Along with the natural gas heat pumps for use in commercial space heating applications as noted above, the Company continues the process of gathering more information regarding Gas-fired Heat Pump Water Heaters. This technology has been identified by the Northwest Energy Efficiency Alliance (NEEA) as a potentially viable technology with costs in a similar range to electric models currently available on the market.

Utility support for technologies like those noted above is important in the industry to demonstrate to manufacturers there is interest in supporting deployment through rate payer funded efficiency programs. The more interest displayed in emerging technologies, the more likely manufacturers are to increase production and market availability.

As mentioned previously, the Company is deeply invested in market transformation and has elected to partner through NEEA with other gas utilities in the region to participate in the first Regional Gas Market Transformation Collaborative in the nation. The goal is to increase market adoption of energy-efficient natural gas products and practices in the future. As part of the project the Collaborative is working toward creating pilots for five distinct technologies. Their goals are to increase the uptake and availability of these technologies in their members' collective service territory in the Northwest. They also seek to improve cost effectiveness of these natural gas technologies. This five-year effort started in 2015 and should result in increased savings as the technology is adapted and uptake increases in future years. The technologies addressed as part of the effort include efficient gas water heaters, combination space and water heating heat-pump systems, condensing natural gas rooftop units (RTUs), residential natural gas ENERGY STAR® dryers and hearth technologies.

Already, Cascade's partnership with NEEA has proven beneficial to identifying opportunities for market transformation, standardization of ratings, and consumer education on available natural gas efficiency technologies.

Continued focus on the role of RTU's and other relevant technologies in Cascade's service area attests to the direct correlation to, and benefit from, the regional efforts partially funded by Cascade's rate payers.

Market Transformation efforts are a key element in increasing accessibility of new technologies to the region. The NEEA collaborative meets on a regular basis to discuss results and next steps of its pilot efforts to move toward these goals. It is important to

recognize, however, that potential savings from market transformation are not realized immediately. Savings are achieved in future years once the market can support the higher-efficiency options and increased customer demand resulting in more advanced technological improvements. Cascade is committed to the continued partnership throughout the remaining two years of the contract and the Company looks forward to 2018 and 2019 reviews of new technology that come as part of the regular discussions.

A mid-cycle evaluation of the Collaborative's efforts occurred in 2017 which has provided the funders and NEEA with valuable insight into the collaborative's successes, achievements and opportunities for improvement. Cascade staff readily engaged in the mid-cycle assessment committee to provide feedback and guidance on how to steer the remaining two years of the five-year effort. The Mid-Cycle Assessment included research into six areas including product advancements, development of a pathway to cost-effective energy savings, evidence of market transformation, adherence to key principles of the Natural Gas Business Plan, the value proposition stakeholders recognized in the plan and NEEA's overall health as a dual-fuel organization.

Key findings from the assessment included the following categories and notes that overall the assessment recommend no significant changes to the portfolio's operations or guiding principles.[2]

1. A majority of market actors believe that NEEA's natural gas activities are valuable and significant
2. Committee members and NEEA staff feel that the portfolio's core technologies have not advanced as far as hoped, but most interviewees remain positive about the portfolio's potential.
3. Committee members have differing expectations about how long it should take to realize savings from portfolio technologies.
4. There is a difference of opinion between most committee members whom are comfortable with progress to date, and one funder who does not believe NEEA should be involved in pre-commercialization activities
5. Most interviewed committee members do not believe that a full integration of the gas and electric portfolios is currently feasible.

Some of the current risks noted as part of the assessment included a risk to the portfolio's continued funding due to:

- Funder concerns about progress of the core technologies
- Funder disagreements about at what stage in product lifecycles NEEA should intervene

[2] Northwest Energy Efficiency Alliance Natural Gas Portfolio Mid-Cycle Assessment – Final Report September 19,2017 Opinion Dynamics

- Funder disagreements about the time horizon for the realization of savings.

The Company will continue to participate with the NEEA collaborative for the remainder of the five-year commitment and will evaluate future participation and partnerships in 2019 near the conclusion of the existing contract.

Cascade continues to participate with the Gas Technology Institute (GTI) Emerging Technology Program to evaluate new technological opportunities as they enter the market. Through these renewed efforts, the Company stays apprised of proven cutting-edge efficiency options with significant savings potential for customers and helps drive some of the advancements taking place in the natural gas high-efficiency realm to benefit the Pacific Northwest.

Potential DSM Measures and Their Costs

To understand the impact declining costs can have on the programmatic potential of natural gas conservation programs, it is important to understand how these programs work. Utility-run energy efficiency programs are designed to encourage the use of high-efficiency natural gas equipment and measures. The Avoided Cost of natural gas is the threshold used to verify if the amount paid by the utility is reasonable.

In short, a utility should not pay more than 100% of the avoided cost of a measure. Likewise, it is considered industry best practice that a rebate should be no lower than around 1/3 the incremental cost of the measure, nor higher than is necessary to achieve maximum anticipated participation. This helps the utility avoid both the risk of free ridership and the hazards of skewing program cost effectiveness and triggering the law of diminishing returns by paying beyond the level of an appropriate market signal.

As of the latest IRP, Cascade can pursue a combined Residential and Commercial/ Industrial conservation portfolio with a total avoided cost range of $5.18 per dekatherm in 2018 to $6.86 in 2037.

Utilizing the UCT, Company program management set the rebate thresholds to achieve an optimal balance between driving program participation and ensuring a broad breadth and depth of measures. The program incentive levels are frequently reviewed with the Conservation Advisory Group, most recently in May of 2017, which resulted in current program offerings referenced here as of the time this Conservation Plan was written.

The Utility Cost Test is the preferred valuation of these measures since it is a straightforward and clean calculation of the utility's investment in Demand Side Management and does not penalize customers for making independent determinations regarding the cost-benefit of an energy efficiency upgrade. The UCT treats the rebate

from utility run natural gas efficiency programs as a leveraged partnership that drives positive market change and the installation of measures with the potential for long-lived and deeper energy savings.

In addition to the use of the Utility Cost Test, in 2014 the Company discussed with its Conservation Advisory Group and Staff the continuation of using its Long-Term Discount Rate to allow longer-lived measures to continue to thrive within its portfolio and prevent reductions and/or slowed momentum as a result of migrating the programs to the WACC. For the 2016 IRP, the Company updated to using the average 30 Year Mortgage Rate as mentioned earlier as its long-term discount rate with a current long-term discount rate of 3.52%. For context, an increased or higher discount rate lowers the therm savings potential while a lower discount rate raises the potential therm savings.

Based on the changes to avoided costs and the continued evolution of building codes and conservation technologies, and in light of the Policy Statement issued through UG 121207, the Company commissioned a study in 2013 to comprehensively reassess its conservation potential and perform evaluation, measurement and verification on previous conservation efforts performed through the Conservation Incentive Program (CIP). This study was noted as a commitment in the Company's 2012 IRP Action Plan. As mentioned in the 2017 Conservation Plan Cascade recognized the study would require updating to maintain relevance and through a commitment in its 2016 IRP contracted with Applied Energy Group (AEG) to develop a new Conservation Potential Assessment to be delivered in Q1 2018 along with a new savings potential modeling tool - LoadMAP.

Assessment of Cascade's Conservation Potential and EM&V Study

As of 2014 the Company discontinued use of its outdated potential assessment study by Stellar/Ecotope and adopted a refined comprehensive reassessment of its potential performed by Nexant Inc. Because of the revised study performed by Nexant, the Company obtained a more nuanced understanding of its conservation potential and was able to further refine and accurately develop conservation targets and portfolios to optimize energy savings in its Washington service territory. The study provided insights into the Company's overall technical, economic, and achievable potential. In addition, Nexant provided the Company with a planning tool for use by Cascade in drilling down to more precise conservation targets for IRP and program planning based on the actual measures included in the conservation portfolio.

The primary goal of the Nexant assessment was to develop an analysis of technical, economic and achievable potential for natural gas energy efficiency for customers on Washington Rate Schedules 503, 504, 505, 511, 570 & 577 (residential, commercial and

non-transport sales industrial customers). This third-party analysis illustrated the remaining savings potential by climate zone, market, segment and end use as a means to inform future program design. The study also integrated a detailed evaluation and measure savings review of Cascade's conservation portfolio.

The Nexant study estimated energy efficiency savings in the form of technical potential, economic potential, and achievable potential through market penetration. Nexant analyzed this potential via a customized Microsoft Excel-based modeling tool, TEA-Pot (**T**echnical/**E**conomic/**A**chievable **Pot**ential) for the Cascade Conservation Potential Assessment.[3] This modeling tool was built on a platform that provided the ability to run multiple scenarios and re-calculate potential savings based on variable inputs such as volume, customer and load profile forecasts, natural gas prices, discount rates, transmission loss rates, inflation rates, multiple adoption curves and avoided costs.

While technical and economic potential are theoretical limits to efficiency savings, achievable potential embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase. Relevant factors to Cascade's conservation program were included in the Achievable Potential to simulate an estimate of real-life conditions. Program potential (i.e. the subset of achievable potential attainable given constraints on program budget and implemented measures) was not presented in Nexant's report. In 2016, the Company had Nexant enable the ability to include administrative costs in the model to attempt to better align the achievable level of potential (inclusive of administrative costs) to more realistically implement and plan programs. For this 2018 Conservation Plan the Company is using its existing modeling tool, but notes the revised CPA and new tool will be available for future program planning in compliance with the commitment made in the 2016 IRP Addendum to model using the Northwest Power and Conservation Council's four-step methodology for calculating conservation potential.

Cost-Effectiveness Testing and Program Design

The following section elaborates on the methods used by current model, the TEA-Pot model, to develop the three levels of Potential for the programs and subsequent creation of the Company's 2-year plan as of this planning cycle.

Industry standard cost effectiveness tests are performed to gauge the economic merits of the portfolio. The Company is exploring incorporation of the Resource Value Test

[3] To review the full study referenced in this section see:
Nexant, Inc. (February 25.2014). Cascade Natural Gas Corporation, Assessment of Achievable Potential & Program Evaluation Volume 1: Executive Summary, Volume 2: Assessment of Achievable Potential & Program Evaluation, Volume 3: Appendices

(RVT) into AEG's LoadMAP modeling tool for the next IRP and Conservation Plan.

Total Resource Cost test (TRC)

This test weighs avoided energy costs and avoided capacity costs for the lifetime of the measure (and non-energy benefits) against the total installed costs and administrative costs incurred by the utility for an energy conservation measure or portfolio to determine if it is in the interests of the customer. It is assumed that a customer's decision to participate in an energy conservation effort is solely economic, and that it is the responsibility of the program administrator to screen-out measures that are expensive as compared to lower efficiency technologies.

Utility Cost Test (UCT)

The benefits in this test are the avoided energy costs and avoided capacity costs for the lifetime of the measure, the same as the TRC benefits. The costs in this test are the program administrator's incentive costs and administrative costs. Under this test, the customer is considered a rational actor who may assign multiple forms of value to an energy conservation purchase. The cost of the measure is not taken into consideration, thus allowing for higher-cost measures with deep, long-term energy savings potential to achieve deeper market transformation.

This plan ran all scenarios under both the TRC and UCT, however, the company maintains, and demonstrates in this plan, that the best test for maximizing potential therm savings is to use the UCT.

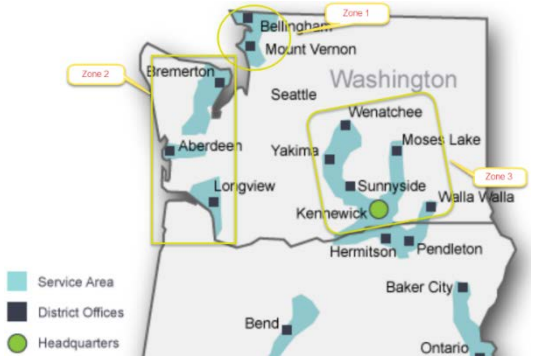
Cost effectiveness was measured under a base-case scenario of Cascade's 2016 IRP's avoided costs and input assumptions, along with current incentive rates, categorized into near 30% and 50%. The Company will further discuss opportunities for altering incentive rates later in this plan. Inputs can be altered within the TEA-Pot model and updated by the Company on an ongoing basis as appropriate.

Market Segmentation Findings

An important first step in calculating Cascade's energy efficiency potential estimates is to establish baseline energy usage characteristics and disaggregate the market by sector, segment, and end use. In its final report to the Company, Nexant offered the Company control totals to which all energy usage was calibrated in the base year of the study and then forecasted while using the same three climate zones the Company has used in the past for calculating its potential. This resulted in a calculation of total natural gas consumption by eligible residential, commercial and industrial customers in Cascade's Washington service territory.

Table 6

Washington Conservation Climate Zones by District		
Zone 1	**Zone 2**	**Zone 3**
• Bellingham	• Aberdeen	• Sunnyside
• Mount Vernon	• Bremerton	• Tri-Cities
	• Longview	• Walla Walla
		• Wenatchee
		• Yakima



Energy Efficiency Portfolio Development

Cascade's energy efficiency potential current model was developed by Nexant in 2013. Based on measures screened through the initial run of the TEA-Pot model for the study, Cascade's forecast was rerun under the following main assumptions for this Conservation Plan:

- Incentive percent of incremental cost (for achievable scenarios): 30% and 50%
- Avoided Costs: 2016 IRP avoided costs, provided in Appendix H of Cascade's 2016 Integrated Resource Plan
- Long Term Discount Rate: The average 30 Year Mortgage Rate, which is reevaluated annually as part of the Company's IRP process. For this plan and the 2016 IRP, the long-term discount rate used is 3.52%. We anticipate the next update will yield an increase in this figure, which is expected to diminish potential slightly, but not significantly.

The high-level screens performed under Nexant's baseline conditions yield total Achievable Potential for the Residential, Commercial and Industrial sectors. The summary pages of the study provide a high-level view into what would be *theoretically* possible without concerns from program budgets, administrative costs or regulatory parameters. Yet, not all measures identified by Nexant remain cost effective under real-world conditions and within the cost-screen thresholds identified in Appendix H of the Company's IRP. The model automatically excludes measures found to not be cost-effective when administrative costs are added.

Cascade evaluated all of Nexant's original energy saving measures' cost effectiveness by climate zone, market segment, and vintage with 2016 IRP conditions in order to discern which could afford the incentive amount increases that were passed mid-2017. The results yielded three groups of measures: Those that were not cost effective at the 30% minimum, those that were cost effective at 30% but could not tolerate an increase, and those that remained cost effective after an incentive increase to 50% of incremental costs.

A summary of the program planning and TEA-Pot modeling scenarios used by the Company for its Conservation Incentive Program portfolio in the 2016 IRP is included here. Following is a visual representation of the process of narrowing down potential from the Technical to the Achievable level employed by the Company currently. Note, this format will update to the Northwest Power and Conservation Council's methodology with adoption of the new model and CPA in Q1 of 2018 and will be represented in the 2018 IRP and Conservation Plan for 2019.

Figure 1
TEA-Pot Technical, Economic and Achievable Potential

Technical Potential
Technical Potential represents a substitution by the end user of all *technically* feasible measures at the end use level

↓

Economic Potential
Economic considers the most efficient measures that pass *economic* screening tests and is a subset of Technical Potential

↓

Achievable Potential
Achievable embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase to simulate a realistic estimate of real-life conditions

DSM Portfolio Updates and Planning

The Company's objectives in developing its rebate offerings center on the desire to:

1. Maximize the inclusiveness of viable, industry-acknowledged conservation measures
2. Maintain incentive levels that send meaningful price signals to consumers to upgrade to high-efficiency natural gas equipment and energy saving measures
3. Remain cost effective at the Company's 2016 IRP avoided costs

Below is a brief snapshot of a few of the elements that go into the process by which the Company narrows down its portfolio, in collaboration with its CAG.

2018 Applied Energy Group CPA and LoadMAP CPA Tool

In 2017 the Company released a Request for Proposal (RFP) to qualified independent evaluators of Energy Efficiency programs seeking a comprehensive reassessment of the Company's Residential, Commercial and Industrial energy efficiency potential (Conservation Potential Assessment, or CPA) under the methodology currently employed by the Northwest Power and Conservation Council (NWPCC) to determine the Company's Achievable Technical potential. The program also required a new executable and dynamic model to support the potential assessment to allow for annual reassessment to be performed internally by CNGC staff to obtain the Company's Economic Achievable Potential over a 21-year forecast horizon.[4] Three vendors responded to the RFP and AEG was awarded the contract. The Company is currently working with AEG on pulling the necessary data together to evaluate the Company's territory and potential and is keeping the CAG updated on progress of the study which is currently on schedule to be completed as of February of 2018.

AEG's modeling framework, the Load Management, Analysis and Planning (LoadMAP) tool was developed as an end-use load forecasting model to allow estimate of conservation potential, built in Microsoft Excel and tailored to meet the needs of the client and due to the scalable nature of the model allows them to analyze potential for a combination of market sectors, segments, climate zones, end uses, technologies and measures.

Tasks in the study include conducting measure research through developing an existing energy savings baseline, non-energy benefits assessment and measure screening. Then characterizing the baseline through base-year market profiles and

[4] Cascade Natural Gas Corporation Energy Efficiency Potential Assessment & Modeling Software Tool for CNGC Washington Territory, Request for Proposal 07/11/17.

projecting the baseline. Then creating the potential analysis inclusive of updated ramp rates (influenced by available Regional Technical Forum data).

One of the key areas of improvement that will be available through the revised CPA and LoadMAP tool is the ability for the company to ascertain its Achievable Technical potential as well as its Economic Achievable potential using the UCT, TRC and RVT which will be obtainable through the new model. The full study, description of the process and CPA will be housed as an appendix item in the Company's 2018 IRP.

Budgeting Parameters

The Company sets an administrative budget to plan and operate programs. This budget must ensure an acceptable ratio of costs balanced with direct benefits for therm savings achievements. Since therm savings offset the costs of administrative investment, the greater the achievement, the more cost-effective the Company's programs. If the budget or therm savings upon which the portfolio is built are unrealistic, there is a risk of developing a scale-dependent portfolio unable to maintain cost effectiveness.

The Company recognizes the need to increase program performance commensurate with higher savings goals. Traditionally it has geared toward a conservative approach when establishing administrative budgets and estimating costs. In fact, the Company repeatedly looked to decrease administrative costs in past program years to offset lower avoided costs and maintain as robust a program portfolio as feasible. In the new realm of increased program achievable goals and expectations, the Company took a close look at areas where it could invest more heavily to meet those goals and encourage uptake.

To maintain a conservative budget and protect the CIP's cost-effectiveness on the portfolio level, past benefit cost ratios were reviewed to determine how much could be available to invest toward increasing program uptake. It was determined under a worst-case-scenario, where therm savings achieved yielded the lowest cost-effectiveness over the past five years (2013), a sufficient buffer existed to both increase the rebate amounts for measures with high enough benefit-cost ratios to 50 percent of incremental costs, as well as bring the Residential delivery in-house in order to improve customer service satisfaction, provide an up-to-date online application processing experience, and allow for faster and more accurate data acquisition.

For example, using the three-year average (2013-2015) of therm savings achieved (648,000) with the Company's three-year average benefit/cost ratio (1.606), under the current Avoided Costs available at the time, as well as an increased 2017 administrative budget, the cushion (which could be used on admin and/or a combination of rebate increases under "costs" in the Utility Cost Test) was approximately $1.45 million.

In addition, the numbers were explored for the worst-case scenario mentioned above. Looking at the lowest performing year (as measured by benefit/cost ratios) 2013 measured 1.306 at a portfolio level, when administrative costs were higher than in 2015 and deemed therm savings achieved were the lowest in six years (471,000). Under this scenario a significant buffer would still exist for increasing administrative efforts by approximately half of the best-case cushion noted above.

Utilizing these two scenarios for best and worst cases helped set budget guidelines to determine which investments could yield the greatest potential increases in therm savings for the program. The Company continues to monitor the effects of ever changing avoided cost impacts to the CIP's budgetary options.

Incentive Level

The Company increased many incentive levels to encourage additional uptake from the base 30% level to 50% of incremental costs, and to where cost-effectiveness was closer to 1.0 than 2.0 or higher. The current program portfolio design was modeled as short-term scenarios in TEA-Pot for 2018 & 2019. Incentive levels had previously been set to around 30 percent of incremental costs as per Nexant's recommendation. In the 2018 CY the Company is looking to develop a more custom approach on setting incentive levels. On an individual basis, the Company may take a more critical look at each measure at a base 30% incentive level and increase the incentive to the customer to leverage all possible savings, potentially up to 75% on some measures as opposed to the current 50% target. This approach will need to be evaluated further for viability at a portfolio level, and accessing program accomplishments for the 2017 calendar year based on the June 30th, 2017 incentive increases will aid with that assessment. An approach of this nature would also assist with maintaining the target DBtC ratio as set by the WUTC.

Targets

TEA-Pot generated targets will be acknowledged in the conservation plan and the Company will aggressively strive towards meeting them as it has committed to do throughout the year. However, the programs will be built in a way that ensures cost-effectiveness can be maintained even if final numbers fall short of that target.

The Conservation Program targets for CY 2018 are lower than those that were set for 2017, due to a variety of factors. The last Conservation Plan included all cost-effective measures at the 50% level of incremental costs. However, due to the timing of the last plan's forecasting conducted at the end of 2016 and the mid-2017 tariff change decision made during the Spring of 2017, the forecasts did not precisely reflect the final rebate amounts that were incorporated into incentive level increases. For this Plan, the scenarios required splitting the measures between the 30% and 50% of incremental cost

categories to better reflect their inherent adoption curves (per the TEAPot model's design) and to reach a more accurate reflection of the short-term conservation potential under current program offerings. More incentives remain below the 50% of incremental cost threshold than previously modeled for, and while cost-effective there, adoption rates are also lower. In addition, for the C/I program, the increased investment in administrative costs, while an attempt to better assure and raise therm savings through increased outreach, conversely impacts cost-effectiveness, and ultimately potential.

Commercial/Industrial Scenarios

It is important to note that the screen conducted with the TEA-Pot tool and internal valuation mechanism for the Commercial/Industrial sector was performed to assess both viable prescriptive and custom measures' potential, thus reflecting inclusion of all available measures from the libraries. For reference, program experience has demonstrated the prescriptive portion of savings from the program is fairly consistent, with an average of around two-thirds of therm savings coming from custom projects. The short-term program forecast for planning purposes divided the measures by their current incentive levels between those in the 30% range and those greater than 50% of incremental costs. The long-term forecasts set all measures to the 50% of incremental costs levels with the aim of increasing program participation.

Program Updates

The Company frequently re-evaluates its program offerings in the changing context of avoided costs, building codes and ENERGY STAR updates. This approach is consistent with how technology on the market gradually increases in efficiency (i.e. market transformation). As per UG-152286[5] the Company is committed to updating the tariffs for the Conservation program at least once per year, and as noted previously the company increased many of the incentives and added new ones as of June 30, 2017. Looking ahead, the following is a summary of the changes in offerings that are being explored for 2018.

The Company will continue to monitor the state of natural gas conservation technologies within its service territory and adjust commensurate with evolving ENERGY STAR standards and codes. Cascade will also monitor promising technologies available to optimize natural gas use in customers' homes. Such measures may include a natural gas heat pump as they become more widespread throughout the market place, or potentially Boiler Pipe Insulation. The Company is also continuing to monitor the residential natural gas furnace standards as well as water heater criteria and will alter the program offerings as standards and building codes change in the next few years. This includes updating the program's criteria around water heater technology to

[5] Washington Utilities and Transportation Commission Docket UG-152286 Order 4, Final Order Approving Settlement Agreement. Page 3-4

accommodate the industry change from EF to UEF ratings. The program has included this measure as a necessary update in the CPA and will update the tariffs in 2018 once final review and evaluation of available measures has been completed.

Additional areas the Company is monitoring and will review for update in 2018 include:

- Revision of the attic insulation offering to accommodate an updated starting R-value
- Review of the maximum Btu cap for residential combination units
- Modification of the Energy Savers Kit offerings
- Updating specifications around the residential ceiling and attic insulation measures
- Inclusion of a smart thermostat offering
- Revision of the door measure
- Potential incentive in lieu of ESK

Program Offerings as of November 2017

All items offered at the time of this writing are based on the 2016 Integrated Resources Plan's avoided costs. Savings assumptions and targets were built from the Nexant Study, TEA-Pot modeling tool and on-the-ground knowledge of Cascade's Washington service area. The Company's conservation portfolios and programs are subject to modification following all changes to the underlying data or circumstances surrounding the assessment and measurement of program cost-effectiveness.

Current residential and prescriptive commercial/industrial program offerings follow.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

Washington Conservation Incentive Program New & Existing Home Incentives

New & Existing Homes

Rebates effective for installs on or after **June 30th, 2017**. Incentives may be subject to change and are only applicable for tariff approved measures in place at the time of installation.

Energy-Saving Measure	Basic Specifications	Incentive
High-Efficiency Natural Gas Furnace[1]	95% + AFUE	$400
High-Efficiency Natural Gas Hearth (Fireplace)[2]	70% + FE (Fireplace Efficiency) 80% + AFUE (Annual Fuel Utilization Efficiency)	$250 $300
High-Efficiency Combination Domestic Hot Water & Hydronic Space Heating System using pre-approved Tankless Water Heater[1&3]	90% + AFUE	$2,500
Condensing High-Efficiency Natural Gas Tankless Water Heater[8]	0.91 + EF	$250
Conventional High-Efficiency Natural Gas Water Heater[8]	0.67 + EF	$45
High-Efficiency Exterior Entry (not sliding) Door[1]	U ≤ 0.21	$100
High-Efficiency Condensing Boiler[1]	95% + AFUE	$500
Programmable Thermostat[1]	7 day (flexibility)/5+2 (workweek/weekend)/5+1+1 day models	$10

Existing Homes Incentives

Energy-Saving Measure	Basic Specifications	Incentive
Floor Insulation[1&4]	Equal to or greater than R-30 or to fill cavity[5], prior condition must not exceed R-11	$0.75/sq.ft.
Wall Insulation[1&4]	Equal to or greater than R-11 or to fill cavity, prior condition must not exceed R-4	$0.75/sq.ft.
Ceiling or Attic Insulation[1&4]	Tier 1: Prior condition must not exceed R-18, Post R ≥ 38 Tier 2: Prior condition must not exceed R-18, Post R ≥ 49	$0.75/sq.ft. $1.00/sq.ft.
Whole House Residential Air Sealing[1&4]	Minimum 400 CFM50 reduction using pre and post blower door testing[6]	$100
Bundle A: In *addition* to your standard incentives.	Any Two: Floor, Wall, Ceiling/Attic Insulation, or Air Sealing. Minimum of 1,000 sqft insulation total.	+$250
Bundle B: In *addition* to your standard incentives.	Air Sealing and any two insulation measures. Minimum of 1,000 sqft insulation total.	+$500

Efficient New Home Packages

Energy-Saving Measure	Basic Specifications	Incentive
ENERGY STAR® Certified Home[1&7]	National Program Requirements Version 3.1 (Rev. 08)	$2,000
Built Green Certified Home[1&7]	Requires Built Green Certification	$2,000

1. *Home must be heated by natural gas and an electric heat pump cannot be present. Built Green measures require proof of a natural gas heating system, such as a photo or invoice.*
2. *Must use intermittent ignition device.*
3. *Water must be heated with a tankless system. Pre-approval from CNGC required.*
4. *All insulation and air sealing must be performed by a CNGC qualified Trade Ally in order to be eligible for a rebate through the Conservation Incentive Program. Attic insulation cannot be filled to cavity.*
5. *Minimum of R-19 or higher to fill cavity.*
6. *Requires WA Department of Commerce Combustion Safety Test Report Exhibit 5.3.1A.*
7. *These incentives are only applicable to new homes, not available to existing homes. They may not be combined with any other measure except Hearths (Fireplaces).*
8. *Water-heating fuel must be provided by Cascade Natural Gas for all water-heating incentives.*

Last Updated 06/2017

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

WA Standard Incentives Commercial/Industrial

Rebates effective on installs on or after June 30, 2017

Warm Air Furnaces - $3.00/kBtu/hr
High Efficiency Condensing Furnace—Min 91% AFUE

HVAC Unit Heater - $1.50/kBtu/hr
High Efficiency Non-Condensing Min—86% AFUE

HVAC Unit Heater - $3.00/kBtu/hr
High Efficiency Condensing Min—92% AFUE

Radiant Heating - $10.00/kBtu/hr
Direct fired radiant heating

Boiler - $4.00/kBtu/hr
High Efficiency Condensing Boiler
Min 90% Thermal Eff & 300 kBtu input

Boiler Vent Damper - $1,000
Min 1,000 kBtu input

Boiler Steam Trap[1] - $125
Min 300 kBtu in; steam pressure at 7psig or >
Retrofit Only

Domestic Hot Water Tanks[3] - $2.50/kBtu/hr
Condensing tank, Min 91% Thermal Eff

Domestic Hot Water Tankless Water Heater[3] - $60/gpm
ENERGY STAR® .82 EF

Attic Insulation - (retrofit only)
Tier 1: Min R-30 - **$1.10/sq ft**
Tier 2: Min R-45 - **$1.25/sq ft**

Roof Insulation - (retrofit only)
Tier 1: Min R-21 - **$1.35/sq ft**
Tier 2: Min R-30 - **$1.60/sq ft**

Wall Insulation[2] - (retrofit only)
Tier 1: Min R-11 - **$1.10/sq ft**
Tier 2: Min R-19 - **$1.25/sq ft**

Energy Savings Kits[3] - FREE
A: Kitchen Pre Rinse Spray Valve & Bath Aerators
B: Low Flow Showerhead

Ozone Injection Laundry[3] - $2,500
Venturi injection or bubble diffusion - Min 125 lb. total washer/extractor capacity. **Pre-approval required.**

Motion Control Faucet[3] - $105
Maximum flow rate of 1.8 gpm
WaterSense® Certified and Below Deck Mixing Valve

Clothes Washer[3] - $180
Commercial gas washer—1.8 MEF

Gas Convection Oven - $500
ENERGY STAR®
≥42% Cooking Eff/ ≤13,000 Btu/hr Idle Rate

Gas Griddle - $500
ENERGY STAR®
≥38% Cooking Eff/ ≤2650 Btu/hr sq ft Idle Rate

Gas Conveyor Oven - $600
Greater than 42% tested baking efficiency

Connectionless 3 Pan Gas Steamer - $850
ENERGY STAR® or CEE/FSTC Qualified
≥38% Cooking Eff / ≤2,083 Btu/hr/pan Idle Rate

Connectionless 6 Pan Gas Steamer - $1,200
ENERGY STAR® or CEE/FSTC Qualified
≥38% Cooking Eff / ≤2,083 Btu/hr/pan Idle Rate

Double Rack Oven - $2,000
FSTC Qualified
≥50% Cooking Eff/ ≤3,500 Btu/hr/Idle Rate D Rack

ENERGY STAR® Gas Fryer - $600

Door Type Dishwasher Low Temp Gas[3] - $800
ENERGY STAR®
≤.6 kw Idle Rate/ ≤1.18 gallon/rack

Multi-Tank Conveyor Low Temp Dishwasher[3] - $2,000
Gas Main w/Electric Booster ENERGY STAR®
≤2.0 kw Idle Rate; ≤ 0.50 gallons/rack

Recirculation Controls[3] - $100
Continuous Operation DHW Pump. Retrofit Only.
Pre-Approval required.

Demand Control Ventilation[4] - $20/nominal ton
5 tons ≤ Unit Cooling Capacity ≤ 20 tons.
Pre-Approval Required.

Hot Fluid Pipe Insulation[3] - Retrofit Only.
>140F, <200F, 1.5" insulation - $4.50 per linear foot
≥ 200F, 2.5" insulation- $9.00 per linear foot

NEW

NEW! Bundle and save in addition to your standard incentive!
Two insulation measures, min. 1000 sqft +$500
Two Kitchen Equipment[5] +$150, Three Kitchen Equipment[5] +$300

NEW

If you are planning equipment or building upgrades that do not fit within the standard incentives, but significantly reduce natural gas consumption, please call 866.450.0005 to learn about **custom project opportunities.**

Mixed purpose facilities that include buildings on both Residential Rate Schedule 503 **and** qualifying Rate Schedules 504, 505, 511, 570, and 577 as part of the same Cascade Natural Gas customer account are also eligible for custom conservation incentives.

1 This measure will only be allowed where the customer agrees to regular trap maintenance and replacement every seven (7) years.
2 Minimum value of R-11 applies only where existing walls have no internal insulation cavities.
3 Incentive eligibility contingent upon use of natural gas fired domestic hot water serving the specified measure equipment or fixture.
4 For Existing Packaged HVAC Units equipped with Gas Fired Furnace and Direct Expansion Cooling Sections DCV Unit; Controller must meet Joint Utility Advanced Rooftop Control Guidelines
5 Kitchen Equipment defined as dishwashers, steamers, ovens, fryers, and griddles.

Updated 06/17

A list of the full measure libraries is available in Appendix A which include administrative costs. Also note, levelized costs differ for some measures depending on the customer's geographic location since Cascade tracks therm savings dependent on which of Washington's three climate zones the measure is installed within. They also differ by market segmentation. The ranges below are based on the 2016 Cascade Natural Gas Conservation Incentive Program Annual Report. Blank entries indicate zero installs in CY 2016 in the specified Climate Zone. However, it is important to note that the 2016 Annual report's inputs were based on the 2014 IRP, and thus much lower cost-effectiveness is shown. For illustrative purposes, the levelized costs per therm based on the 2016 IRP have been provided here.

Table 7
Residential Offerings for Tariff 300 from the 2016 Annual Report, comparing 2014/2016 IRP inputs

MEASURE	ZONE	ANNUAL THERM SAVINGS	PROGRAM REBATE (Dollars)	UC 2014 IRP	UC 2016 IRP	Benefit-Cost Ratio 2014 IRP	Benefit-Cost Ratio 2016 IRP
Built Green Certified Home	Zone 3	210	600	$0.347	$0.321	1.257	3.748
Ceiling Insulation per Sq. Ft.	Zone 1	0.062	0.3	$0.390	$0.351	1.058	4.726
Ceiling Insulation per Sq. Ft.	Zone 2	0.057	0.3	$0.411	$0.370	1.003	4.484
Ceiling Insulation per Sq. Ft.	Zone 3	0.067	0.3	$0.372	$0.335	1.109	4.953
.91 Tankless Hot Water Heater	Zone 1	54	150	$0.465	$0.441	0.990	1.985
.91 Tankless Hot Water Heater	Zone 2	54	150	$0.465	$0.441	0.990	1.985
.91 Tankless Hot Water Heater	Zone 3	54	150	$0.465	$0.441	0.990	1.985
.67 Water Heater	Zone 1	33	45	$0.382	$0.364	1.234	2.285
.67 Water Heater	Zone 2	33	45	$0.382	$0.364	1.234	2.285
.67 Water Heater	Zone 3	33	45	$0.382	$0.364	1.234	2.285
Energy Savings Kit 1	Zone 1	17	10	$0.450	$0.435	1.076	1.612
Energy Savings Kit 1	Zone 2	17	10	$0.450	$0.435	1.076	1.612
Energy Savings Kit 1	Zone 3	17	10	$0.450	$0.435	1.076	1.612
Energy Savings Kit 2	Zone 1	31	16	$0.441	$0.427	1.098	1.645

Energy Savings Kit 2	Zone 2	31	16	$0.441	$0.427	1.098	1.645
Energy Savings Kit 2	Zone 3	31	16	$0.441	$0.427	1.098	1.645
ENERGY STAR Certified Home	Zone 3	207	600	$0.350	$0.323	1.249	3.722
Floor Insulation per Sq. Ft.	Zone 1	0.056	0.3	$0.416	$0.374	0.992	4.433
Floor Insulation per Sq. Ft.	Zone 2	0.054	0.3	$0.426	$0.383	0.969	4.331
Floor Insulation per Sq. Ft.	Zone 3	0.059	0.3	$0.402	$0.362	1.026	4.582
High Efficiency Combination Radiant Heat	Zone 1	475	825	$0.345	$0.325	1.329	2.964
High Efficiency Combination Radiant Heat	Zone 2	468	825	$0.347	$0.327	1.321	2.948
High Efficiency Combination Radiant Heat	Zone 3	476	825	$0.345	$0.325	1.330	2.966
High Efficiency Entryway Door	Zone 1	13	50	$0.448	$0.418	0.989	2.525
High Efficiency Entryway Door	Zone 3	13	50	$0.448	$0.418	0.989	2.525
95% AFUE New Gas Furnace (New & Existing)	Zone 1	111	250	$0.423	$0.401	1.089	2.182
95% AFUE New Gas Furnace (New & Existing)	Zone 2	110	250	$0.425	$0.403	1.085	2.174
95% AFUE New Gas Furnace (New & Existing)	Zone 3	111	250	$0.423	$0.401	1.089	2.182
70% FE Hearth	Zone 1	56	150	$0.426	$0.402	1.060	2.285
70% FE Hearth	Zone 2	56	150	$0.426	$0.402	1.060	2.285
70% FE Hearth	Zone 3	56	150	$ 0.426	$0.402	1.060	2.285
80% AFUE Hearth	Zone 1	75	250	$0.475	$0.448	0.951	2.050
95% AFUE Gas Furn Upgrade E*	Zone 2	110	250	$0.425	$0.403	1.085	2.174
95% AFUE Gas Furn Upgrade E*	Zone 3	111	250	$0.423	$0.401	1.089	2.182
Wall Insulation per Sq. Ft.	Zone 1	0.071	0.35	$0.395	$0.355	1.046	4.672

Wall Insulation per Sq. Ft.	Zone 2	0.065	0.35	$0.417	$0.375	0.989	4.419
Wall Insulation per Sq. Ft.	Zone 3	0.076	0.35	$0.379	$0.340	1.090	4.870
Residential Air Sealing	Zone 1	75	100	$0.441	$0.424	1.071	1.776
TOTAL PROGRAM				$0.409	$0.382	1.134	2.618

Table 8
Commercial/Industrial Offerings for Tariff 302 from the 2016 Annual Report, comparing 2014/2016 IRP inputs

MEASURE	COUNT	ANNUAL THERM SAVINGS/ UNIT	PROGRAM REBATE	TOTAL REBATES COST	LOADED UC 2014 IRP	BENEFIT COST RATIO 2014 IRP	LOADED UC 2016 IRP	BENEFIT COST RATIO 2016 IRP
Standard Measures								
Warm Air Furnace	37.00	1.10	$3.00	$10,158.00	$0.552	0.834	$0.523	1.672
Domestic Hot Water Tanks	36.00	0.79	$2.50	$22,196.48	$0.667	0.712	$0.637	1.272
Clothes Washer	1.00	90.00	$180	$1,800.00	$0.766	0.631	$0.742	0.946
Boiler	38.00	1.50	$4.00	$248,927.20	$0.510	0.886	$0.482	1.909
DHW Tankless Water Heater	2.00	35.00	$60	$609.00	$0.471	0.978	$0.446	1.960
Attic Insulation Tier 1 (New Tariff)	4.00	0.31	$0.50	$13,622.00	$0.341	1.281	$0.315	3.818
Wall Insulation Tier 2 (New Tariff)	1.00	0.19	$0.56	$515.20	$0.420	1.041	$0.388	3.102
Motion Control Faucet	1.00	136.00	$105	$840.00	$1.114	0.436	$1.094	0.562
Radiant Heating (New Tariff)	7.00	4.330	$6.95	$4,170.00	$0.462	0.997	$0.438	1.997
Door Type Dishwasher Low Temp Gas	3.00	448	$650	$1,950.00	$0.604	0.787	$0.582	1.264
Gas Fryer - Restaurant	29.00	685	$600	$26,400.00	$0.542	0.877	$0.522	1.408
Gas Convection Oven – Lodging	3.00	219.	$450	$2,250.00	$0.669	0.711	$0.644	1.141

Gas Convection Oven - Restaurant	2.00	649	$450	$1,350.00	$0.523	0.910	$0.503	1.461
Gas Convection Oven - School	1.00	141	$450	$1,800.00	$0.792	0.601	$0.762	0.965
Insulation-Attic	1.00	0.320	$0.65	$3,253.25	$0.366	1.194	$0.338	3.560
Insulation-Attic	3.00	0.320	$0.78	$7,466.94	$0.390	1.121	$0.360	3.341
Insulation-Roof	2.00	0.360	$0.96	$44,611.20	$0.403	1.083	$0.372	3.229
ESK A *	17.00	109	-	$3,094	$1.186	0.409	$1.165	0.528
ESK B *	6.00	14	-	$8,756	$0.909	0.532	$0.880	0.798
Custom Measures								
Custom Economizer	1.00	18,347	$8,485	$8,485	$1.044	0.465	$1.025	0.599
Steam Traps Custom	1.00	5,312	$4,061	$4,061	$0.449	1.059	$0.429	1.892
Restaurant Custom Catalyst DCV Controller	1.00	837	$581	$581	$0.442	1.074	$0.422	1.919
High School Custom and Standard	1.00	380	$394	$394	$0.560	0.850	$0.539	1.365
Restaurant Kennewick Standard and Custom	1.00	250	$223	$223	$0.629	0.769	$0.609	1.153
Middle School Standard & Custom	1.00	3,923	$4,945	$4,945	$0.494	0.962	$0.472	1.719
Waste Water Treatment Plant Biogas Custom	1.00	8,900	$16,031	$16,031	$0.389	1.140	$0.363	2.910
Retirement Residence Custom Shower Heads	1.00	684	$405	$405	$0.512	0.929	$0.493	1.492
Custom Control Upgrade	1.00	3,809.000	$4,801	$4,801	$0.494	0.962	$0.472	1.719
TOTAL PROGRAM				$443,695.27	$0.512	0.933	$0.483	1.870

Washington Low Income Program

Since 2008, Cascade has partnered with Washington's low-income weatherization providers to deliver the Low-Income Weatherization Incentive Program (WIP). The WIP

provides rebates to low income agencies delivering home energy improvements to eligible Cascade customers. The program is supplemented by the Enhanced Low-Income Weatherization Incentive Program (EWIP) which took effect on February 1, 2017.

The creation of EWIP resulted from discussions with the Company's Conservation Advisory Group (CAG) on ways to remove barriers to Agency participation. These meetings and subsequent program changes were consistent with regulatory directives to coordinate with the CAG and Energy Project to overcome barriers to the implementation of the WIP program. Cascade received feedback from both the Agencies and CAG stakeholders indicating previous CNG low-income weatherization rebates based solely on avoided costs were insufficient to cover the full expense of natural gas weatherization.

On Wednesday, October 5, 2016 the Company presented the CAG with a discussion paper centered on potential revisions to Cascade's WIP. Points of discussion included:

1) Identifying barriers to success, such as program design constraints; natural gas weatherization costs; and Federal guidelines. This included exploring the current design of the WIP, Federal prioritization methods inhibiting deeper penetration of the program, and areas of potential improvement;

2) Identifying potential solutions to increase program viability by addressing the limitations associated with the current funding mechanism; and to potentially reconfigure the current program design to meet the needs of the agencies delivering the program.

Following this discussion, Cascade staff integrated feedback from the CAG to redesign the WIP. The changes and expansions that resulted from this effort are described below:

The traditional Weatherization Incentive Program covers the installation of certain energy efficiency measures following the completion of a home energy evaluation performed by a qualifying Community Action Agency or Low-Income Agency. Calculations for rebates are based on projected annual therm savings of the measure(s) x 100% of the Avoided Cost per therm.

Under the Enhanced Weatherization Program, participating Agencies are also eligible to receive a rebate payment designed to bridge the gap between the avoided cost payment and the amount of the total installed cost of the approved weatherization measure/s. Installed cost includes incidental repair work necessary to the installation of a qualified measure. Total payment is capped at $10,000 per project. A memorandum of

understanding with a committed number of annual projects is required for each Agency interested in participating in EWIP.

Both WIP and EWIP participants receive an audit fee of $550 and an inspection fee of $300 per dwelling for homes weatherized through the revised tariff 301.

The following measures qualify for a rebate through the current WIP/EWIP tariff. New measures have been highlighted in **bold**:

Table 9
Current Low-Income Weatherization rebate offerings from Tariff 301

Measure	Avoided Cost per Therm
Ceiling Insulation	$8.09
Wall Insulation	$8.09
Floor Insulation	$8.09
Duct Sealing & Insulation	$6.15
Infiltration Reduction	$6.15
Low-flow Faucet Aerator	**$3.56**
Low-flow Showerhead	**$3.56**
Natural Gas Furnaces (95% AFUE or greater) *	**$6.15**
Furnace Tune-Up and Filter Replacement	**$3.56**
Direct Vent Natural Gas Space Heater (90% AFUE or greater)	**$6.15**
Natural Gas Water Heater (0.91 EF or greater tankless)	**$6.15**
Natural Gas Water Heater (0.64 EF or greater storage)	**$6.15**

* Unless Department of Commerce specifications specifically recommend a lower efficiency unit, and documentation is provided to the Company to verify this is the case.

To qualify for a rebate, all measures must be cost effective with a Savings to Investment Ration (SIR) of 1.0 or more using the TREAT software, or qualify as cost effective under

the Washington State Department of Commerce Weatherization Priority List.

In addition to the changes described above, Cascade continues to carefully monitor its annual achievements and remaining barriers to program participation. Participation for each program year prior to the EWIP tariff expansion can be found below.

Per the request of the Energy Project, Cascade has also included data on the avoided cost per therm paid for 30-year measures for each program year. The Company has further added the total funds paid out to the Agencies per year and the average rebate per home to Table 10.

Table 10

Weatherization Incentive Program Participation Levels and Savings by Year					
Year	**Number of Homes Served**	**Therm Savings**	**Total Funds Paid Out to Agencies**	**Average Rebate Per Home**	**Avoided Cost Per Therm Paid for 30-Year Measures**
2008	46	13,985	$101,631.02	$2,209.37	$13.06
2009	55	14,733	$168,378.33	$3,061.42	$13.06
2010	112	30,809	$358,315.78	$3,199.25	$13.06
2011	85	24,130	$251,248.28	$2,991.05	$11.66
2012	64	21,824	$233,162.27	$3,643.16	$11.66
2013	38	14,960	$132,881.79	$3,496.89	$8.09
2014	21	7,338	$54,374.00	$2,589.23	$8.09
2015	19	11,724	$89,508.21	$4,710.96	$8.09
2016	24	11,743	$87,064.73	$3,627.70	$8.09

Preliminary findings for the 2017 Program year are as follows:

Approximately **22** projects were submitted as of November 2017, representing **4,617** therms saved and **$157,396.81** paid out to agencies with combined WIP and EWIP monies. An average of **$7,154.40** was provided as rebates per project this program year.

While ramp-up of homes served under the new EWIP has been slow, several agencies have expressed strong interest in the new program design and are in process of further incorporating Cascade's WIP/E-WIP monies into their program budgets with the purpose of serving more low income natural gas homes.

As represented in Table 10, the number of homes served by the agencies with funds leveraged through WIP has fluctuated greatly over time, peaking in 2010, and declining thereafter.

As observed by the Energy Project, participation in WIP was highest during the time when natural gas costs were highest. The higher avoided cost per therm resulted in higher avoided cost payments associated with the work performed. Energy Project posits that the higher energy burden of natural gas households at that time also resulted in greater prioritization of natural gas weatherization work by the Agencies.

The Company agrees Agency participation does partially correlate to the avoided cost per therm payment available under WIP. However, it is relevant to note the average rebate provided per home under the Cascade WIP has increased over time.

- The average rebate for all years in total (excluding 2017) are **$3,281.00**.

- The average rebate during 2008-2010 when the avoided cost was $13.06 was **$2,823.35** per home.

- The average rebate during 2011-2012 when the avoided cost was $11.66 was **$3,317.11** per home.

- The average rebate during 2013-2016 when the avoided cost was $8.09 was **$3,606.20** per home.

These findings suggest participating agencies have received a higher rebate per home over the last several years regardless of the avoided cost per therm. Cascade believes this upward funding trend reflects both the careful review performed for each application to ensure Agencies receive all entitled funds; and the laudable efforts of actively participating Agencies to achieve as many therm savings as possible within each home.

Participation levels, however, remain in decline, leaving the Company concerned Agencies are not taking full advantage of the leveraged program monies available for natural gas weatherization. Based on current results, it is anticipated CY 2017 will remain consistent with this reduced level.

Cascade has had ongoing discussions with the Agencies and the Energy Project to better understand barriers to implementation. These discussions resulted in the E-WIP tariff which allows higher funding levels independent of avoided costs by bridging the gap between what can be reimbursed based on energy costs, and the total installed cost of the qualified weatherization measure. Through the E-WIP program total rebates paid per home are capped at $10,000.

The average rebate from the program adjustment has increased significantly with a

preliminary estimate of approximately **$7,000** per home being provided to participating agencies. Participation, however, remains limited even with this increased funding.

The Energy Project and Cascade have both noted a potential barrier to implementation was inherent in the increased complexity of federal standards in place regarding diagnostic testing requirements over this timeline – CY 2008-2016. This significantly increased the cost of projects and may therefore have impacts on project feasibility.

In addition, agencies follow DOE rules that prioritize households with:

- The elderly;
- Persons with disabilities;
- Families with children;
- High residential energy users; and
- Households with a high energy burden (placing current focus on electric, propane, and heating oil customers in WA State, which means that natural gas heated homes can see less investment of federal and state dollars)

It was the Company's hope that the increased funds provided via E-WIP would help mitigate this barrier. However, participation remains low even with strong upward modifications.

Cascade continues to work with the Agencies and Energy Project to determine remaining barriers to implementation. Recent feedback has been received from several sources.

The Opportunity Council and the Energy Project have requested further administrative expenses be covered by the utility. Cascade will continue to monitor program participation, and will make adjustments following a full year of available program data under the significantly increased funding of the E-WIP program. It has been the Company's preference to date to focus funding on the completion of physical weatherization work with direct benefit to low income natural gas households.

Blue Mountain Action Council has also reached out to the Company, requesting the Company consider removing the $10,000 per home rebate cap to compensate for a shortfall of available state monies. Until more funds are available, their ability to serve Cascade Natural Gas homes in any capacity is extremely limited.

A request for increased funding beyond the $10,000 EWIP cap due to inadequate funding from other sources poses a broader policy question regarding the role of regulated utilities as a primary source of funds for low income weatherization. This alteration to the program format would signal a significant shift in the role of utility

monies as a secondary, leveraged funding source utilized to stretch federal and state weatherization monies, and move the Company to serving as the primary source of natural gas weatherization funds, with state and federal monies instead used to stretch utility dollars further. The Company is not able to address this requested alteration at this time as it is (as stated above) fundamentally a policy, and not a program administration question.

Undoubtedly, some Agencies are facing barriers due to an increased dependence on natural gas utility funding as a primary source of weatherization monies.

Paradoxically, information recently provided to the Energy Project by the Washington State University Energy Extension Project, suggests some Agencies have been actively weatherizing significant numbers of natural gas homes and chose not to seek reimbursement from the Company for most, if not all, of their weatherization projects.

In an email from the Energy Project dated November 17, 2017, which was sent to the Company and its Conservation Advisory Group, it appears there may have been as many as **225** additional homes served by the agencies in total from 2012 to 2017 alone. While the Company is relieved to hear that more low-income households have been served than was initially understood, Cascade is concerned that significant monies remained on the table that could have been leveraged to serve even more natural gas households.

As noted by the Company annual average reimbursements have peaked at nearly **$5,000** in 2015 with approximately **$4,000** on average in 2016. Even if one considers these years as outliers, the averaged rebate amount for all years prior to the implementation of EWIP (2008-2016) was **$3,281.00.**

Had the Company been notified of these weatherization projects (assuming they were for tariff-qualified measures), and the average of $3,281 per project had been leveraged, over **700,000** additional dollars could have been provided to agencies for further weatherization projects. This excludes any additional funds that were left on the table from 2008 through 2011 (which were not addressed in the email provided by the Energy Project).

That said, it is possible that some of these unsubmitted projects could have been for measures that were not allowed under the traditional WIP program. In such an event, the numbers provided by Energy Project still reflect a present opportunity for Agencies to take advantage of the expanded offerings available under EWIP to leverage the funds sitting on the table for these measures. However, it is unlikely none of the projects

referenced the Energy Extension Program's project count were eligible for Cascade weatherization dollars.

The Company is appreciative of the Agencies and our other WIP partners. Once a full year of the EWIP program has been completed, Cascade will reassess the program and determine, the best pathway forward to serving more homes. We will continue to meet with our CAG and the Energy Project to address these matters as appropriate.

In the meantime, based on actual participation, Cascade is downwardly adjusting its WIP/EWIP targets from its last conservation plan to more realistically reflect the number of homes the Company anticipates will be served.

Conservation Programs in 2018

The Company expects in the next year to engage the CAG in additional discussions around rebate levels and portfolios updates for the 2018 program year. As mentioned previously, the Advisory Group showed interest in the Company moving away from its traditional method of maintaining the most robust cost-effective portfolio as feasible with rebates set near 30% of the incremental cost of the measure. The Company explored varying levels of incentive per viable measure near the end of Q1 2017, and increased the incentive levels to make them more enticing to consumers, without adversely affecting the programs or inadvertently promoting free-ridership. As this change in incentive levels is recognized by customers the Company will take the opportunity to study the uptake in rebate applications and analyze whether the rebate payment increase had a direct impact on the rebate submission rates. Once the program has operated under these increased rebates for a longer period, it will provide valuable analytical data and enable the Company to further revise its portfolio as appropriate.

As the Company becomes more familiar with the strengths and capabilities of the iDSM Central software, and continues to build the historical database through everyday use, there has been an opportunity to more fully capture actual installed equipment costs based on real data collected from the Company's service territory. One of the elements noted by Nexant Inc. in the potential study and evaluation from 2014 was a need for the Company to track the actual installed cost of measures on a regular basis. Installers frequently do not provide a detailed invoice broken down to the level of equipment cost vs. labor, however when the data is available it provides a key metric the Company can use in future program planning and evaluation. The Company has evaluated this data and is able to provide this valuable territory specific data for the AEG LoadMAP Conservation Potential Assessment.

There is also a likelihood the Company start tailoring targeted energy-efficiency marketing efforts and outreach in climate zones and towns where the potential in that zone is not being met. Cascade's method of forecasting savings potential based on climate zone has allowed close tracking of achievements throughout 2017, and positioned the Company to act on this tracking in 2018 to pivot efforts as needs are identified.

Calendar year 2018 also provides further opportunity to explore more robust messaging opportunities online for the program. One opportunity currently being explored is the addition of an online energy assessment for residential customers. These efforts will be geared toward increasing program uptake throughout the territory to meet the program goals as indicated by the TEA-Pot model.

Conservation Programs in 2019

The Company is also planning for CY 2019 as part of its near-term Conservation Plan. Many of the elements put in place in 2018 lay the groundwork for the following program year, with the ultimate driver being to reach goals set in place through the IRP and the Conservation Plan.

At this time, the Company foresees the following elements of the program that will occur in CY 2019

- The NEEA gas market collaborative five-year pilot will complete at the end of 2019. As part of the effort the Company will continue its discussions with the committee to evaluate next steps and whether continued funding is a viable option from a regulatory and programmatic perspective. These discussions will occur within the NEEA committees and internally at Cascade CAG meetings to fully understand the impact from the pilot and continued influence on the region's natural gas customers, rate payers and program expenses. The NEEA collaborative is currently engaging in discussions on viability of reviewing the business plan and whether some of the efforts should be redirected and/or revised. The Company will partake in these discussions with a keen eye toward future program viability, with a key element of the decision weighing on what type of savings have been achieved and what can, or should, be claimed after the initial five years of funding has been expended.

- The Nexant iDSM Central software currently in use for the residential, low income and trade ally programs will need to be reviewed and/or renewed before the end of 2019. The Company has devoted a substantial amount of time and effort to utilize the system to its greatest potential and will critically evaluate whether the significant investment in the software warrants continued use past CY 2019, or whether an alternative software solution would be viable. An additional consideration would be whether the Company wishes to incorporate

its commercial program rebate data and processing into a single program which would require additional investment to migrate the program into the iDSM Central software platform.

- The program will review its Commercial Program implementation processes and evaluate whether an altered delivery model would be prudent to continued success, savings achievements and growth of the program. This process could involve discussions with the current program delivery vendor, releasing an RFP for vendor selection and/or evaluating feasibility of delivering the program in-house through CNGC staff.

- The program's internal tracking Evaluation, Measurement and Verification tool within iDSM Central should be in place and be gathering data as of 2019 and will allow for analysis from the Company to compare actual program participation savings to deemed savings. Once the Company has a significant enough dataset to work from, it should open the door to discussions with the CAG on viability of an EM&V study from a third-party vendor contingent of funding availability and program cost-effectiveness based on program uptake.

- The Company analyzed current energy-efficiency financing options and applicability to Cascade's programs in 2017 in conjunction with on bill repayments. It was found at the time that these features were not a good match for inclusion in the 2018 program offerings. However, the Company will reevaluate inclusion of financing and possibly on-bill repayment toward the end of 2018 for adoption in the 2019 CY.

Forward Looking Targets/ TEA-Pot Forecasts

As mentioned previously, the method Cascade used to calculate potential is the TEA-Pot modeling tool (developed in 2013/2014 by Nexant Inc.). The study's analysis at the time was based on calendar year 2012 and tailored to Cascade's specific service territory.

The following section provides Cascade's achievable forecast by climate zone and customer class as per TEA-Pot calculations from October 2017 for the 10-year horizon.

Assumptions

The full measure libraries for all customer classes was reviewed and updates to measure lives and incremental costs were made. Incremental cost data was derived from historical project data. Instances of two outlier price points (more than double the max value of all

other data points) were removed. Models with no cost data were disregarded. The following is a summary of the changes made to the measure libraries before running the forecasts:

- ENERGY STAR and Built Green® measure lives were increased from 7 to 30 years
- Insulation measure lives were increased from 27.5 to 45 years for attic and wall, and from 20 to 45 years for floor
- Updated Built Green and ENERGY STAR certified incremental costs based on the ENERGY STAR Cost and Savings' incremental costs, Total Upgrade Costs for Climate Zone 5 under Gas Furnace October, 2016 to $2117 from $1142
- Changed New HE Condensing Boiler for Water and Space Heating's adoption curve of Tech for CZ1 to Tech and Econ.
- Changed 80% Hearth's Incremental costs from $600 to $1800 per January tariff change discussions based on review of historical project invoice data.

The changes incorporated as part of this potential run are enabling the Company to provide AEG viable current data within the measure library to start working from for the new model and CPA.

When running the model both the Residential and the Commercial/Industrial programs used all technologically available measures for the long-term forecast (Years 3-10) on the Residential side and the full forecast, short and long (all years) under the Commercial and Industrial scenarios. This methodology was implemented in lieu of past Commercial/Industrial forecast modeling where solely the prescriptive measures offered under the current tariff in place at the time of writing were included. The current methodology accounts for capturing the savings inherent to the custom project sector more accurately, in addition to the prescriptive measure offerings. On the Residential side, this allows for a full review of the cost-effective measures available in the library to consider for future changes to the menu of offerings.

In addition, for both the Residential and Commercial/Industrial programs, measures deemed cost effective at the 50% level of incremental costs were run through the model at the higher incentive level, consistent with the last plan. A full list of included measures by customer class are available in *Appendix A*.

Inputs

Below is a summary of the other model inputs, which remain consistent with the 2016 Conservation Plan:

- Inflation rate is 1.00%

- Transmission Loss rate of 0.1348%

- Long Term Discount rate decrease to 3.52

- Administrative Costs increased to bring the Residential program administration in house, thereby increasing accuracy of reporting and improving control of the customers' rebate processing experiences. It also allowed expansion of Commercial and Industrial CIP outreach. The 2018 budget was set at $566,500 for the Residential program and $1.25 million for the Commercial/Industrial to accommodate the additional outreach efforts. Note, while this may appear to have a negative impact on the Benefit-Cost ratios for each measure, and raises the costs needed to acquire therm savings, it is necessary to accommodate higher therm savings goals by expanding outreach efforts, and thereby program recognition.

- Avoided Costs used were the same.

- Load Profile, Customers and Volume Forecasts, by Climate Zone, were not updated and remained consistent with the 2016 IRP per the Demand Forecast chapter.

Scenarios

The following list of 54 scenarios were run for this edition of the conservation plan:

Residential, 18

1. UCT Residential, Climate Zone 1, 30 %, Short Term
2. UCT Residential, Climate Zone 1, 50 %, Short Term
3. UCT Residential, Climate Zone 1, 50 %, Long Term
4. UCT Residential, Climate Zone 2, 30 %, Short Term
5. UCT Residential, Climate Zone 2, 50 %, Short Term
6. UCT Residential, Climate Zone 2, 50 %, Long Term
7. UCT Residential, Climate Zone 3, 30 %, Short Term
8. UCT Residential, Climate Zone 3, 50 %, Short Term
9. UCT Residential, Climate Zone 3, 50 %, Long Term
10. TRC Residential, Climate Zone 1, 30 %, Short Term
11. TRC Residential, Climate Zone 1, 50 %, Short Term
12. TRC Residential, Climate Zone 1, 50 %, Long Term
13. TRC Residential, Climate Zone 2, 30 %, Short Term
14. TRC Residential, Climate Zone 2, 50 %, Short Term
15. TRC Residential, Climate Zone 2, 50 %, Long Term
16. TRC Residential, Climate Zone 3, 30 %, Short Term
17. TRC Residential, Climate Zone 3, 50 %, Short Term
18. TRC Residential, Climate Zone 3, 50 %, Long Term

Commercial, 18

19. UCT Commercial, Climate Zone 1, 30 %, Short Term
20. UCT Commercial, Climate Zone 1, 50 %, Short Term
21. UCT Commercial, Climate Zone 1, 50 %, Long Term
22. UCT Commercial, Climate Zone 2, 30 %, Short Term
23. UCT Commercial, Climate Zone 2, 50 %, Short Term
24. UCT Commercial, Climate Zone 2, 50 %, Long Term
25. UCT Commercial, Climate Zone 3, 30 %, Short Term
26. UCT Commercial, Climate Zone 3, 50 %, Short Term
27. UCT Commercial, Climate Zone 3, 50 %, Long Term
28. TRC Commercial, Climate Zone 1, 30 %, Short Term
29. TRC Commercial, Climate Zone 1, 50 %, Short Term
30. TRC Commercial, Climate Zone 1, 50 %, Long Term
31. TRC Commercial, Climate Zone 2, 30 %, Short Term
32. TRC Commercial, Climate Zone 2, 50 %, Short Term
33. TRC Commercial, Climate Zone 2, 50 %, Long Term
34. TRC Commercial, Climate Zone 3, 30 %, Short Term
35. TRC Commercial, Climate Zone 3, 50 %, Short Term
36. TRC Commercial, Climate Zone 3, 50 %, Long Term

Industrial, 18

37. UCT Industrial, Climate Zone 1, 30 %, Short Term
38. UCT Industrial, Climate Zone 1, 50 %, Short Term
39. UCT Industrial, Climate Zone 1, 50 %, Long Term
40. UCT Industrial, Climate Zone 2, 30 %, Short Term
41. UCT Industrial, Climate Zone 2, 50 %, Short Term
42. UCT Industrial, Climate Zone 2, 50 %, Long Term
43. UCT Industrial, Climate Zone 3, 30 %, Short Term
44. UCT Industrial, Climate Zone 3, 50 %, Short Term
45. UCT Industrial, Climate Zone 3, 50 %, Long Term
46. TRC Industrial, Climate Zone 1, 30 %, Short Term
47. TRC Industrial, Climate Zone 1, 50 %, Short Term
48. TRC Industrial, Climate Zone 1, 50 %, Long Term
49. TRC Industrial, Climate Zone 2, 30 %, Short Term
50. TRC Industrial, Climate Zone 2, 50 %, Short Term
51. TRC Industrial, Climate Zone 2, 50 %, Long Term
52. TRC Industrial, Climate Zone 3, 30 %, Short Term
53. TRC Industrial, Climate Zone 3, 50 %, Short Term
54. TRC Industrial, Climate Zone 3, 50 %, Long Term

Forecasts

A summary of the results of the forecasts can be found below. For the results of the full forecasts by scenario, please see Appendix A.

Figures 3, 4 and 5 represent a comparison of the residential, commercial, and industrial forecasts by climate zone. This climate zone specific comparison illustrates the difference between geographic areas, each with its own unique program participation ratios.

Figure 3

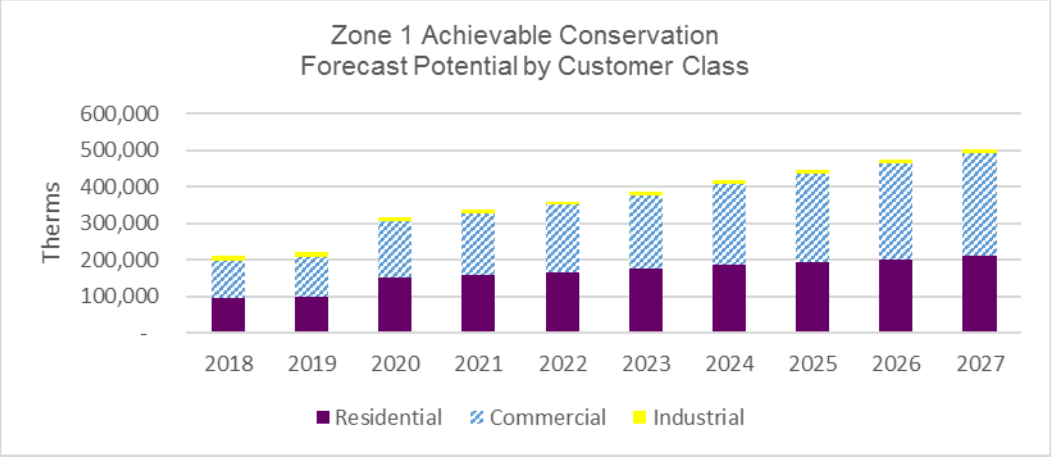


Figure 4

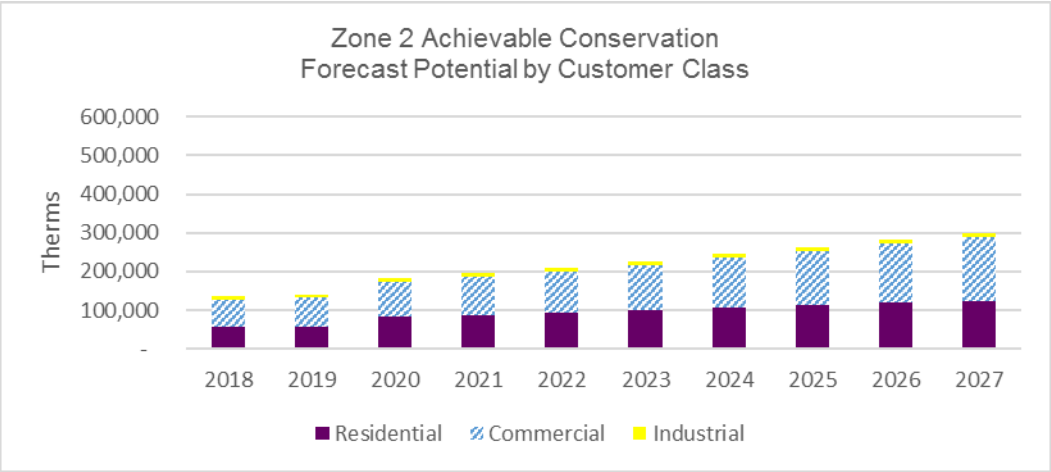


Figure 5

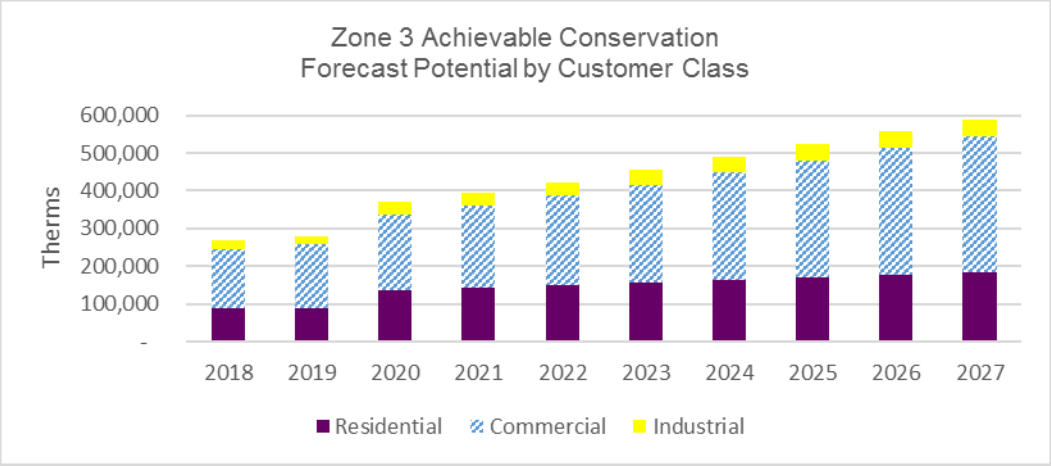
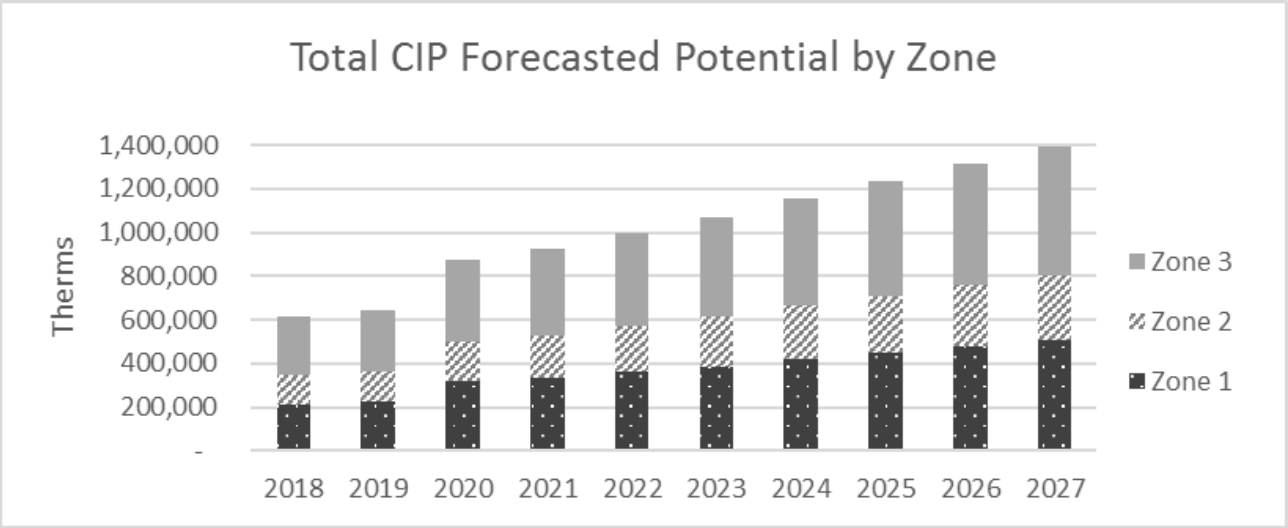


Figure six below shows the combined forecasts by each climate zone's contribution.

Figure 6



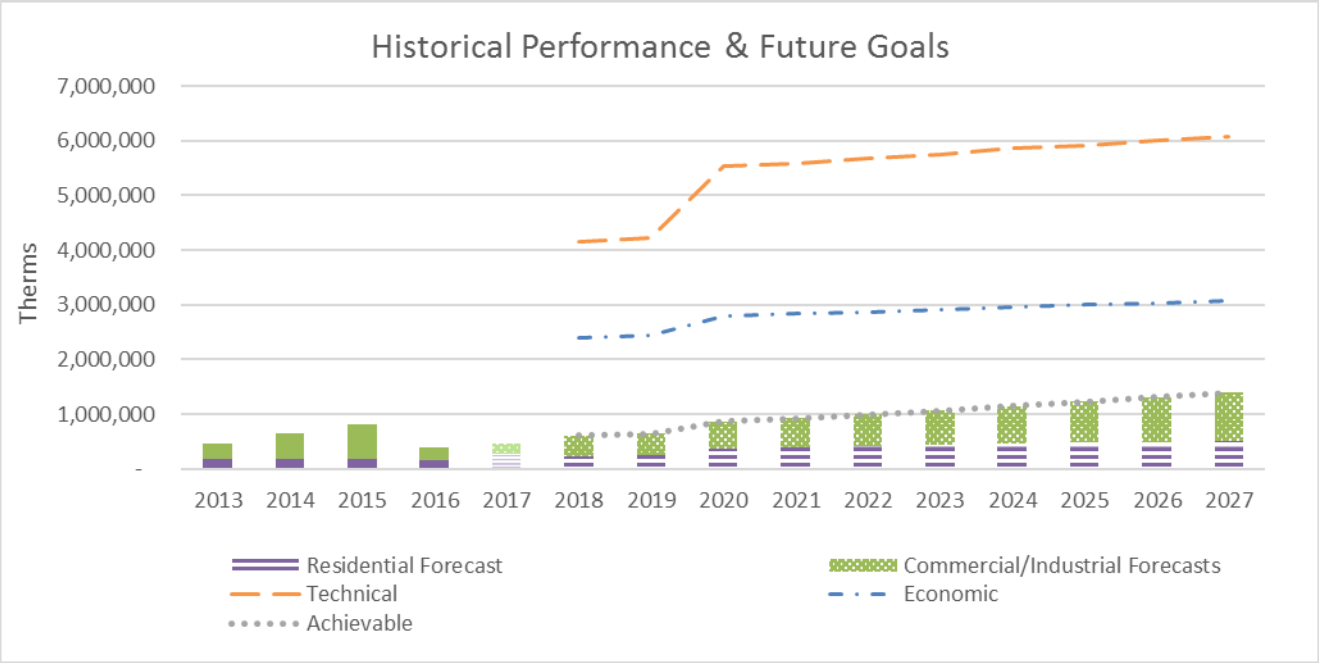
Note the potential for future plans will be run under the revised LoadMAP model which will utilize the NWPCC methodology more commonly employed in the Pacific Northwest. For this plan Nexant's model provides three levels of potential: Technical, Economic, and Achievable which are further defined below:

- *Technical Potential*: An estimate of all energy savings that could theoretically be accomplished if every customer that could potentially install a conservation measure did so without consideration of market barriers such as cost and customer awareness.
- *Economic Potential*: The most efficient measures that pass economic screening tests and is a subset of Technical Potential. Because measures' cost effectiveness differs by Climate Zone, market segmentation, and vintage, Cascade implements a 0.90 cost-effectiveness threshold to include the largest breadth of measures feasible.
- *Achievable Potential:* Embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase to simulate a realistic estimate of real-life conditions.

As mentioned in the previous section, the model was run individually by climate zone to provide increased granularity. The outcomes shown in that section are by climate zone, whereas the summary of the model's output below demonstrates Technical, Economic, and Achievable therm savings potentials side-by-side, in addition to the past four years of program performance for perspective. Note, 2017 figures are not official at the time of writing as the program still has several months to go in 2017, however, we have provided a look at on the programs are tracking. Further analysis and representations

of these forecasts can be found in *Appendix A*.

Figure 7
Technical, Economic, Achievable 10-year potential snapshot



The line graph above provides two separate lines denoting the savings potentials for Technical and Economic levels, followed by the Achievable Residential and Commercial /Industrial targets.

CY 2018 & 2019 Targets

Cascade is providing targets the Company has reported for its conservation potential based on the same inputs as the 2016 IRP but with updates to the measure libraries and administrative costs, in the following section. The Company has included the most up to date Achievable goals as per the TEA-Pot model *inclusive* of administrative costs as goals for 2018 and 2019. These goals have been developed keeping in mind the recent updates the Cascade program recently implemented.

In the next two years, the Company will continue to explore the cost-effectiveness of measures that will be included in the full AEG review and not currently offered in its portfolio based on availability to the marketplace, administrative costs in implementing and a variety of other elements. The company will also be monitoring the price signals sent via the current and potential incentive levels for all programs.

The Company is aware it is important to demonstrate the level of savings that could be achieved should the full breadth of offerings be included in the program portfolio throughout the 10-year plan horizon. It is also important to recognize the portfolio will likely change throughout the next two years to accommodate building codes and technology updates.

The following graphs show the next ten years' worth of savings potential in Cascade's territory based on customer type under all three potential levels as well as past program actual performance compared to the next two years of forecasted savings.

Figure 8

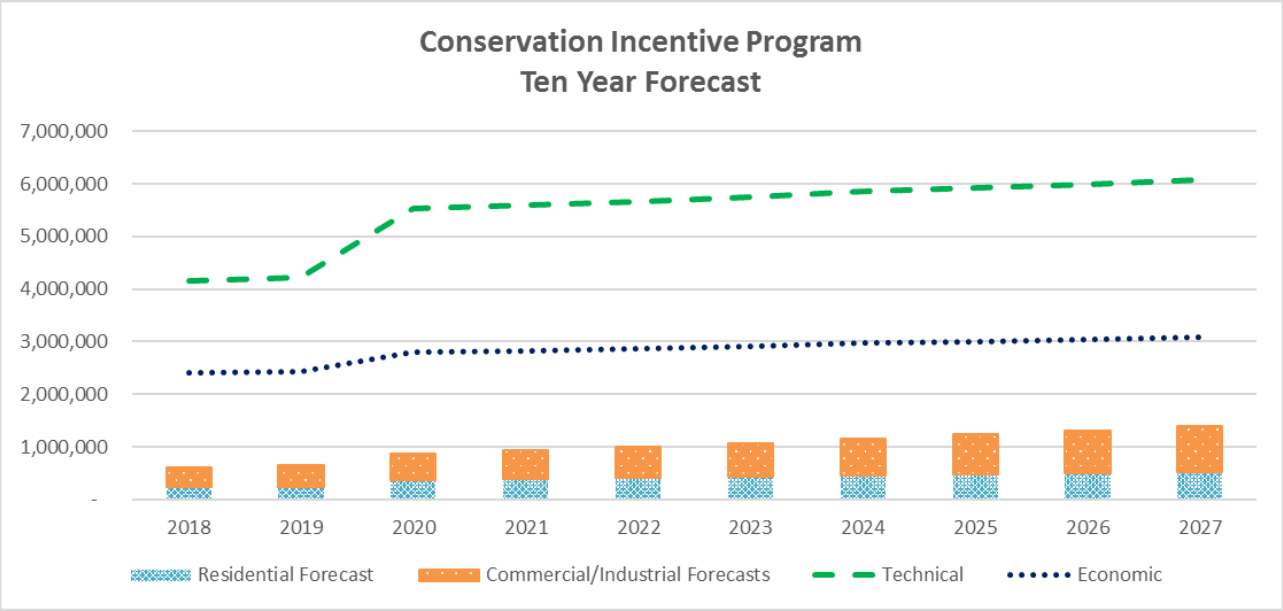
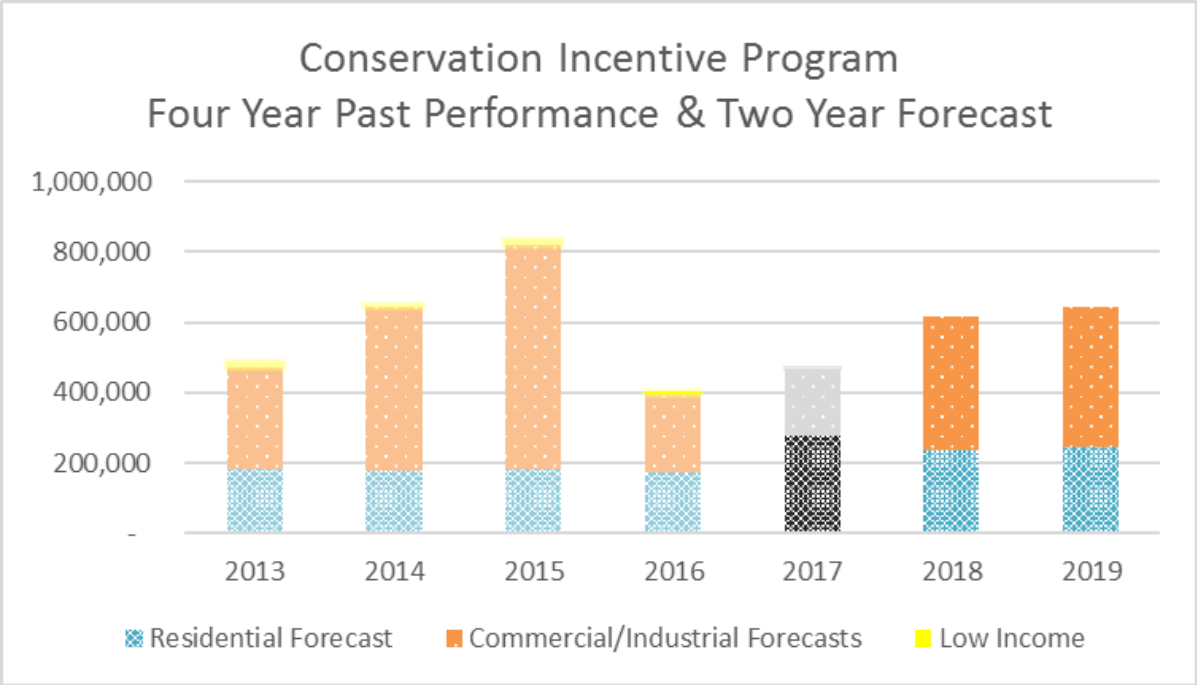


Figure 9



The figures below compare last year's Conservation Plan with this years under the UCT and the TRC. The UCT allows for a more robust menu of rebate offerings, in addition to higher incentives in line with covering a higher amount of the incremental costs. Finally, the UCT allows for higher potential therm savings.

The difference between the last Conservation Plan and the current iteration stems from changes which went into effect as of the June 30th, 2017 tariff update to the portfolio of offerings. The last Conservation Plan model was run using recommended rebate amounts, whereas the final incentives included in the update differed somewhat from what was originally modeled.

In addition, the administrative budget for the Commercial and Industrial program is expected to increase significantly, by 25 percent, due to an update to the contracting structure currently in use the third-party vendor. This higher investment is required to meet higher therm savings targets with a guarantee of savings, however, it does have an impact on the cost-effectiveness of the measures in the Commercial and Industrial libraries.

Figure 10

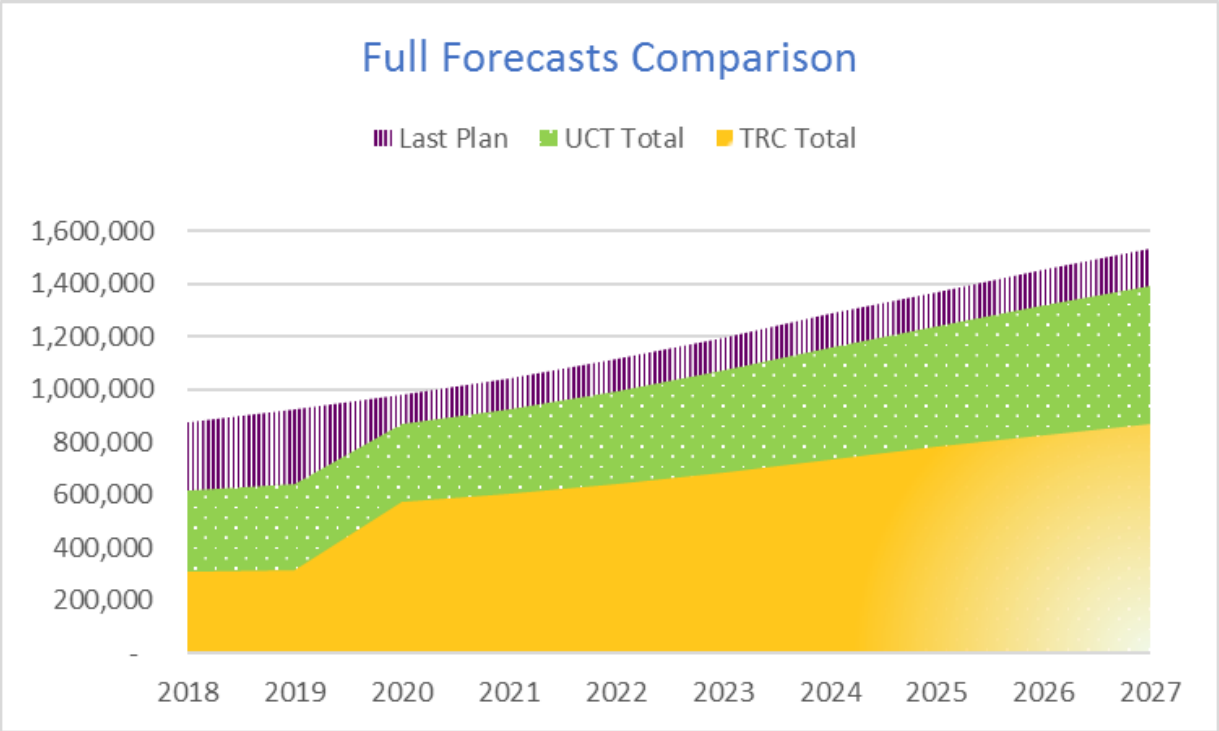


Figure 11

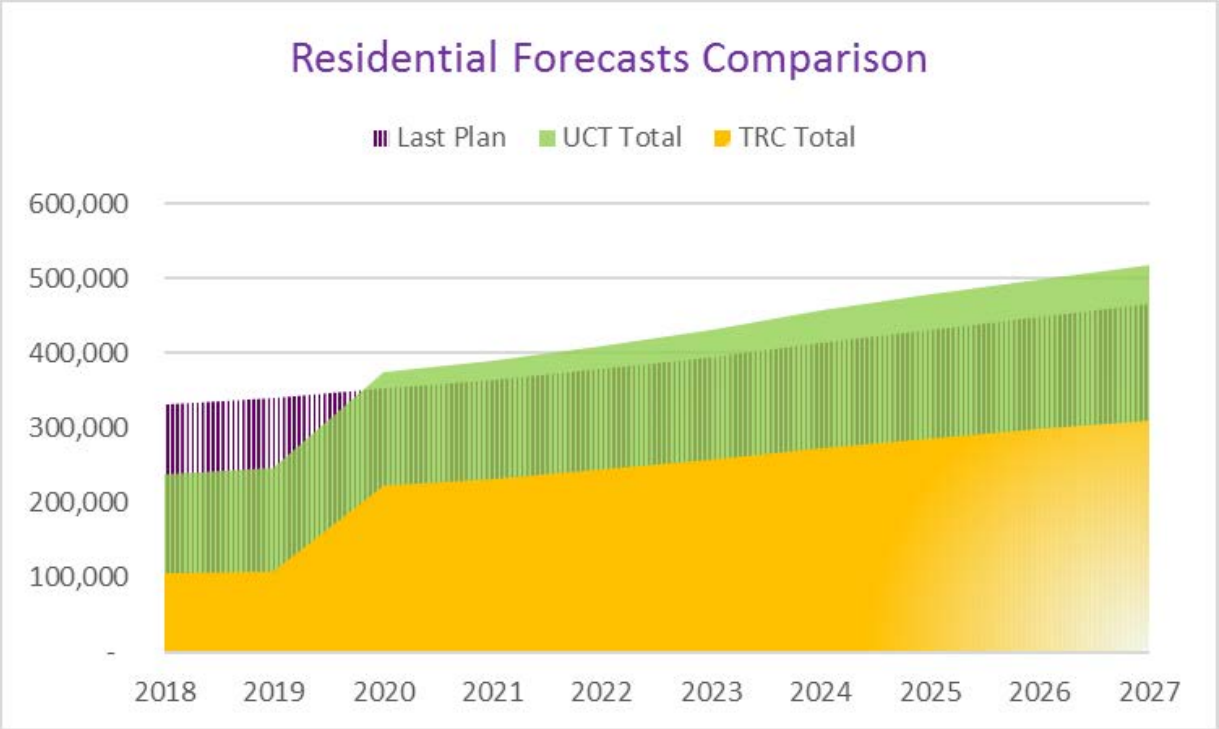
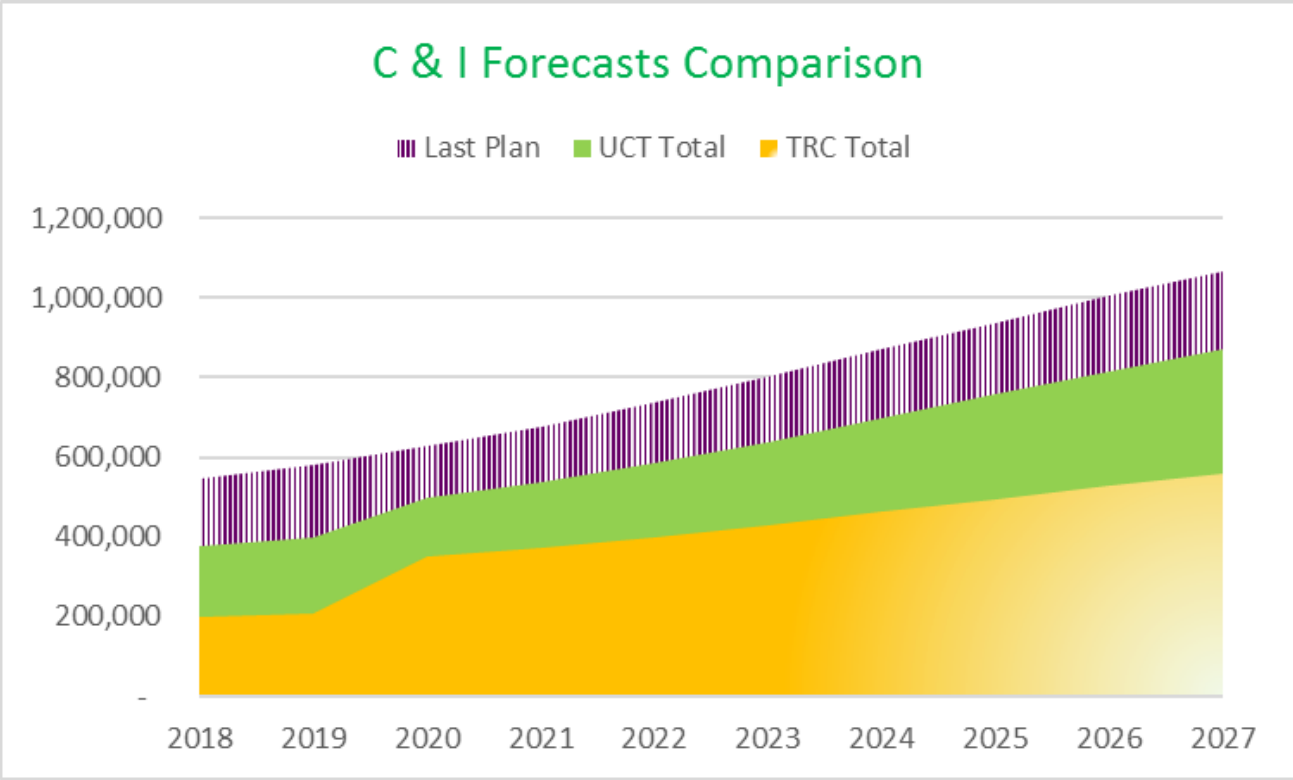


Figure 12



These projected achievements are based on the Company's current best estimates of its Achievable potential, which are based on projected gas costs. Projections are subject to modification dependent upon updated forecasts; knowledge of evolving efficiency technologies; customer interest and program participation levels; and updates based on external influences. Budgets for FY 2018 and 2019 are based commensurately with these targets and adjusted to ensure maintenance of cost-effectiveness and appropriate levelized costs. The Company anticipates the budget on a portfolio level for 2018 to be in the range of **$1.8 million** in administrative costs to support the increased goals for the residential program. FY 2018 is estimated to have a budget up to $**1.87 million**.

Note some of the set-up and development costs for the Residential software package will be paid in 2018 as opposed to 2016 or 2017 due to a lag in invoicing from delays in delivery timelines. Specifically, the EM&V portion of the contract is not anticipated to be in production until late 2018. The Company also includes expected participation costs for the five-year NEEA pilot (total **$1,705,130**) as agreed in January 2015. CNGC lists these costs in the Annual Conservation Report and will represent the program's cost-effectiveness primarily without the NEEA pilot efforts due to the lack of certainty surrounding the immediate claimable therm savings for the Company's service territory, but also with the costs included in the analysis to demonstrate its effect on the cost-

effectiveness of the program as a whole.

Table 11
Cascade Natural Gas NEEA Natural Gas Market Transformation Pilot Participation

Year	Cascade's Washington Commitment at 9.3% of total budget for 5-year pilot
2015	$145,872
2016	$244,996
2017	$313,174
2018	$452,285
2019	$548,803
Total	$1,705,130

Long term Conservation Potential

The Company is providing the incremental annual potential savings for this Conservation Plan for years 2018-2027 below.

Table 12

Year	Technical	Economic	Residential Achievable	Commercial /Industrial Achievable*	Total Achievable
2018	4,160,528	2,967,299	238,627	377,640	616,267
2019	4,222,997	3,012,769	246,299	396,712	643,011
2020	5,532,432	3,721,122	374,705	496,619	871,324
2021	5,589,831	3,762,710	390,394	535,680	926,074
2022	5,669,940	3,819,409	410,232	583,589	993,821
2023	5,752,047	3,878,243	432,060	637,765	1,069,825
2024	5,857,888	3,952,694	457,097	699,025	1,156,122
2025	5,916,379	3,995,777	478,182	756,711	1,234,893
2026	5,998,388	4,053,954	499,503	816,340	1,315,843
2027	4,160,528	2,967,299	518,765	872,271	1,391,036

Note – Low Income program goals are included in the total residential achievable. CY 2018 LI Goal is 5,000 therms, 2019 & 2020 is 10,000 and the remainder of the 10-year forecast currently hosts a goal of 15,000 therms per year.

Note, short-term goals are more realistic when viewed in two-year increments since they allow flexibility in addressing current legislative, building code and budgeting criteria.

Many specific details are required to implement successful programs. As discussed above, the program potential, that which is based from actual implementation design, delivery, and market conditions, reflects some variance in savings, costs, and overall achievements. Customer participation in a program is heavily influenced by the level of incentive paid by the utility versus the cost to the customer.

External infrastructure considerations must also be addressed, such as product availability to utility customers and an adequate network of contractors, retailers, and trade allies to support a program. As new measures or expanded programs are developed and added to the current program mix, internal and external resources and capabilities need to grow accordingly and progress through a "learning curve." Additionally, revised projections regarding the cost of natural gas and other external factors will always lead to revisions to the Company's existing programs, and will result in additional impacts on the company's projected participation levels.

Planning and EM&V

The Company and its software vendor Nexant Inc. is continuing the process of customizing and building the iDSM Central platform for the Cascade residential programs including iTrade Ally support. As part of the transition to internal program delivery, the Company researched ways to cost-effectively increase Evaluation, Measurement and Verification opportunities within the program reporting software platform. Nexant is committed as a partner in further developing the opportunities inherent in its software into Calendar year 2018. The following year will provide the Company with the means to use the software to provide the tracking and groundwork for future EM&V efforts, potentially in conjunction with additional outside evaluations in future years when deemed necessary and not cost-prohibitive as indicated in the ***Conservation Programs in 2019*** section.

Housing Stock Assessment Review from NEEA

One of the areas CAG stakeholders requested Cascade explore and incorporate into future efforts involves engaging further with NEEA in relation to their housing assessment reports. These reports encompass a snapshot of a specific building stock (Residential and Commercial) and have information relevant to natural gas service percentages throughout each of the years of the study. This will enable a view into trends amongst gas usage and gas equipment types. Although the reports do not have gas meter data they have been a key element of the NEEA efforts to understand the market

potential in the region. The desire is for Cascade to work with NEEA staff to develop recommendations for exploring what else can be extrapolated specific to Cascade as a gas utility from the data to help in updates to the Company's programs.

Cascade has specifically tasked its CPA vendor (AEG) to include NEEA housing stock assessment report data in the CPA and has reached out to NEEA to become a member of the Conservation Advisory Group. This partnership has allowed the Company to better understand and appreciate the data and expertise available through NEEA's efforts and will continue to play into the Company's program plans and updates into CY 2018.

Outreach & Messaging Campaigns

The Company frequently reaches out to the public to notify rate payers of available incentives in order to drive uptake of the Conservation Incentive Programs – thereby reducing overall consumption of natural gas. CNGC approaches its customer-facing energy efficiency messaging through an integrated marketing strategy - ideally multiple marketing methods or avenues are used to deliver a single (unified) message.

This method utilizes a consistent, frequently reinforced message to increase brand awareness of the Cascade CIP to the public, and specifically Cascade customers. In addition to the integrated marketing approach, the Company is also employing a cross channel marketing practice whereby the customer not only receives messaging via multiple mediums, but can also use their preferred medium to interact with Cascade's programs. Cascade is strategic in its approach to reaching customers and thus does not employ *all* possible channels of outreach since marketing can be a costly endeavor. The Company focuses on marketing channels that take advantage of existing messaging venues and synergies in those which have traditionally been employed by leveraging existing partnerships and communication channels and adding new opportunities as they arise. Ultimately the Company tries to keep its energy efficiency message useful, low-profile (yet impactful) and natural in its placement.

The marketing world is rapidly changing with additional technology and social media opportunities. The Company's CIP has traditionally centered on traditional messaging avenues, but is poised in the next year to move further into the digital and social media realm to reach rate payers through more commonly used media channels while keeping the integrated messaging model in mind.

Current examples of methods customers use to obtain information and/or interact with the program include accessing program data through the program's microsite www.cngc.com/conservation, applying to receive a residential rebate through a customer portal https://cngc.dsmcentral.com/traksmart4/public/registration.do, sending

in a hard copy application through the mail, contacting the program via phone or email and direct one-on-one interactions during an event staffed by CNGC representatives.

In turn, the Company has multiple avenues in place to deliver program messaging including bill inserts to existing customers, radio advertising, event participation, community engagement and program material placement in external publications. The Company also employs targeted outreach efforts when appropriate or trying to reach a specific audience. The company has also recognized that increased savings goals requires additional outreach and messaging to those key audiences, which means additional funding and attention put toward public outreach.

The company's messaging campaigns include elements of consistency for brand awareness with a key focus on the Conservation Incentive Programs offered through Cascade as a standard go-to for high-efficiency options. Ideally the Company wants to assist customers by reducing the barrier inherent in purchasing higher-performance appliances and measures by offsetting the cost difference of the upgrades,

It's important for Cascade to consistently tailor its outreach and message to its intended audience whether that's a residential customer, commercial business, contractor network, home builder, real-estate professional or a financial advisor. This is readily apparent when the Company evaluates which print media to advertise in, and what the message should be. For instance, a home builder's association directory would be an odd placement for an ad describing the Company's commercial food service incentive offerings.

Community Participation - A Key to Program Longevity and Support

One area Cascade has repeatedly found essential to increased program participation and awareness is involvement with local community energy efforts and programs. The Company has long followed the motto *"In the Community to Serve"* which is strongly reinforced through the offerings provided through the Energy-Efficiency and Community Outreach Department. Energy program efforts outside of the utility programs are a valuable resource for the utility to leverage existing relationships to reach a new audience while reinforcing the energy-efficiency message to audiences the Company has targeted in the past.

The following discussion highlights some of the community groups and areas the Company will continue to partner with:

On an annual basis Cascade partners with community energy programs including Sustainable Connections and the Community Energy Challenge in Whatcom and Skagit

County and the Sustainable Living Center in Walla Walla. The Company provides funds to assist with delivery of its program information and pave the way for additional customers to apply for rebates while working through the local auditors and the Community Energy Efficiency Programs (CEEP) where available. The CEEP were created by the Washington State Legislature in 2009 and administered by the Washington State University Extension Energy Program. The funds were used to help deliver energy efficiency upgrades to targeted customers throughout Washington State – both homeowners and small businesses alike. Funding for the program participants originated with the U.S. Department of Energy's State Energy Program and the American Recovery and Reinvestment Act. Once the pilot efforts had wrapped up additional funding was provided to the organizations to leverage already existing community investment. See *Appendix B* for copies of the sponsorship letter agreements between the Company and Sustainable Connections, Community Energy Challenge and the Sustainable Living Center which list out the benefits of partnering with the agencies for their energy use reduction collaborative efforts from 2017.

These CEEP funded organizations have been creative in the methods used to help customers reduce usage – ranging from performing energy audits, suggesting energy-saving efforts, leveraging utility rebates, creating and maintaining Trade Ally networks of qualified contractors and providing additional rebates on top of the existing utility sponsored rebates. In each of these situations, the CEEP group has been an integral partner with the utility in providing personal interactions with community members to help them apply, and more importantly, qualify for the rebate program. In many situations, the community organization has helped make the final push to encourage the customer to go with the higher-efficiency options by providing an in-depth understanding of how the different elements of the home affect their comfort, health and overall energy use. Having the ability to partner with local organizations whose efforts include reaching out and performing these services has proved immensely beneficial to all parties in the equation. If a customer can look at their energy use on a whole home basis as opposed to a one-off upgrade approach the overall reduction and potential for repeat efforts increases dramatically.

The Company has spent the past several years working with four towns within its service territory, three of which are in Washington, in their community wide effort to reduce energy use in the residential and municipal realm. Walla Walla, Bellingham and Anacortes engaged in the Georgetown University Energy Prize (GUEP) Competition an effort to encourage local governments and utilities to work with their communities to develop and implement plans for replicable, innovative, scalable and consistent reductions in natural gas and electric consumption. Three areas of import for the competition include:

- Spurring innovative approaches for communities to decrease their per-capita energy usage;
- Highlighting best practices for communities working with utilities, businesses, and their local governments to create and implement inventive plans for sustained energy efficiency;
- Educate the public and engage students in energy efficiency issues including methods, benefits and the environmental costs of the full fuel cycle.

Support from the Company involved assisting the GUEP with developing best practices in data tracking from a utility perspective, providing quality aggregate data downloads to track reductions in the participating towns and providing miscellaneous assistance as requested to the cities in the variety of activities and events they have engaged in within the communities to promote the efforts. The competition timeframe concluded at the end of 2016, however final evaluation and data management continued into CY 2017 for finalist selection. The Company has consistently provided support to these towns by tabling at outreach events and providing program outreach and materials to the engaged communities including the Anacortes Energy Fair. In addition to general program materials the Company provided a copy of a coloring book cover that was tailored to efficiency messaging for local students interested in energy-efficiency which can be viewed in the *Appendix B.* Note the remainder of the coloring book includes low-cost/no-cost tips for children to reduce their energy use. As of the writing of this plan the final selection for the GUEP is yet to be announced and the Company will continue to support the communities engaging in the Competition as requested.

Cascade has also found great value in coordinating with the Western Washington University Institute for Energy Studies. This partnership has grown for the past two years and has been an excellent opportunity for Cascade to provide support to the Sustainability efforts on the Campus with information about its Energy-Efficiency programs, tabling at events as they arise and providing guest lectures about demand side management and associated efficiency programs for multiple classes at the university including a Business of Energy and an Energy Policy class in support of the Energy Policy and Management major as well as the Energy Policy minor. See *Appendix B* for a copy of a table handout provided as part of the Energy Summit symposium at the University.

Company representatives are also involved in a Women in Energy Mentoring Network (WIEMN) which meets monthly and provides students an opportunity to talk to professionals throughout the industry about various energy topics including efficiency and renewable resources. Its goal is to develop leadership skills in students while

maintaining diversity in energy studies and the energy industry through the support and feedback of professionals.

In 2017 Cascade again partnered with other utilities in the Tri-Cities area to provide an Energy Experience to local junior high students. The event's goal was to target middle school students and educate them about energy generation, production, safety, efficiency and conservation. Participation by Cascade helped increase awareness of natural gas as a source of energy in the home and how it is used, and in turn how it could be conserved. It also provided an opportunity to talk about the Cascade rebate program in terms of rebates, home energy consumption, and the importance of understanding how a home performs and can be audited, see *Appendix B* for a copy of the flyer developed for the outreach event to students. The event is slated to occur again in 2018 with the Company planning to continue participation.

Cascade also takes advantage of environmental awareness during Earth Day and has created a 1-2 week long messaging campaign to promote the EE programs and energy efficiency tips. See *Appendix B* for the conservation tips played throughout the campaign and below for the 60 second commercial script:

> ***MUSIC BED:*** *UPBEAT SPRING MUSIC*
>
> ***ANNC****: LOOKING TO MAKE AN IMPACT ON THE ENVIRONMENT? OR RATHER LESS OF AN IMPACT! TAKE ADVANTAGE OF EARTH WEEK AS YOUR INSPIRATION TO REDUCE ENERGY WASTE AND ENERGY BILLS! CONTACT CASCADE NATURAL GAS'S ENERGY EFFICIENCY STAFF TO FIND OUT HOW YOU CAN SAVE MONEY AND ENERGY WHILE HELPING THE ENVIRONMENT.*
>
> *CASCADE NATURAL GAS OFFERS REBATES WHEN YOU REPLACE INEFFICIENT HEATING EQUIPMENT WITH HIGH EFFICIENCY ONES. YOUR NEW HIGH-EFFICIENCY APPLIANCES WILL SAVE ON HEATING BILLS, AND GIVE YOU A LONG-TERM RETURN ON YOUR HOME INVESTMENT.*
>
> *THERE ARE ALSO REBATES AVAILABLE FOR CASCADE TRADE ALLY INSTALLED INSULATION. AND WHILE YOU'RE SAVING ON OVERALL ENERGY COSTS, YOU'LL FEEL GOOD, KNOWING YOU'RE REDUCING YOUR CARBON FOOTPRINT TO PROTECT THE EARTH.*
>
> *NOW'S AN IDEAL TIME TO START DOWN THE PATH TO EFFICIENCY AND RESPONSIBLE ENERGY USE. CASCADE NATURAL GAS' ENERGY EFFICIENCY PROGRAM IS ON YOUR SIDE.*
>
> *MAKE THIS THE YEAR YOU TAKE ACTION!*
>
> *CALL CASCADE NATURAL GAS TODAY OR GO ONLINE AT C N G C DOT COM BACKSLASH CONSERVATION FOR MORE INFORMATION*

In accordance with the Company's integrated marketing efforts Cascade has also branched out to its customers through an alternative messaging venue from standard energy efficiency focused events in the community. During the spring and summer season for the past three years the energy efficiency department has worked closely with the safety department on a joint message. The groups will continue outreach of this nature in future years, although the final format will be determined based on discussions with the advertisers and team. A messaging campaign was provided during the Walla Walla Sweets baseball team and Yakima Pippins baseball team seasons for the Company to provide information about natural gas safety going hand-in-hand with efficient use of natural gas. See *Appendix B* for a copy of a handout provided to all attendees at the games as well images of the tabling and signs at the fields. Overall program impressions at one of the fields was more than 1,300 fans viewing the messaging each night throughout the season for 33 games equating to 43,213 individuals being exposed to the Cascade EE message, and at the other field 41,875 fans attended games this season. The campaign included the following elements:

- Either a 3'x4' poster at the stadium entrance or a 6'x10' concourse sign
- In-game promotion of safe digging (811 promotion) - (*please note costs for this element of the messaging were not covered through deferred funds*)
- 30 second video board commercial during Yakima game
- 30 second radio commercial per game

  Cheering sound with announcer's voice fading saying "safe" or "you're out"

  VOICE 1: *WE LOVE A GOOD TRIPLE PLAY, DON'T YOU?*

  VOICE 2: *WHAT DO YOU MEAN?*

  VOICE 1: *FOR CASCADE NATURAL GAS IT'S THE COMFORT AND RELIABILITY OF NATURAL GAS HEAT, THE ASSURANCE OF A SMART ENERGY CHOICE PAIRED WITH REBATE ELIGIBLE HIGH-EFFICIENCY UPGRADES AND KEEPING YOUR FAMILY SAFE BY CALLING 811 AT LEAST TWO BUSINESS DAYS BEFORE DIGGING TO MARK UNDERGROUND LINES.*

  VOICE 1: *CONTACT CASCADE AT CNGC.COM OR 1-888-522-1130 FOR REBATES AND INFORMATION*

  VOICE 2: *GOOD IDEA, I ALWAYS LIKE TO COVER MY BASES!*

- 3 tabling nights at each field with distribution of up to 600 efficiency flyers per game
- Web-button linking to CNGC and the efficiency programs from the team's website

Energy efficiency messaging is also provided when requested for support of District Office community engagement efforts including the items from a theatre event in Walla Walla in *Appendix B* from 2017.

As mentioned last year, Cascade began updating its program outreach materials into Spanish to ensure the Company is engaging more fully with the Latino community in its energy efficiency education and awareness. Part of the community engagement involved speaking at a Hispanic Chamber of Commerce meeting in the Tri-Cities area and translating the Company's incentive sheets and applications into Spanish. There is now a Spanish language landing page on the Conservation Corner microsite and the Company released a combined Spanish/English bill insert about efficiency in October. See *Appendix B* for a copy of the insert.

Residential Focus

The Company takes advantage of the opportunity to message to its customers on the energy efficiency programs whenever possible and cost effective. One example includes the monthly energy efficiency bill insert sent to all core customers through their utility bills in both an electronic and hard copy form. This venue continues to be a viable and consistent format for providing efficiency messaging and updates to customers on program offerings. See *Appendix B* for samples of inserts sent during CY 2017. The bill inserts are commonly residential customer focused as it's important for the decision makers in the home to receive the messaging. Having said that, the Company has also referenced its commercial program offerings in bill inserts, has provided targeted messages to specific towns and has partnered with local community partners on occasion. The residential application tracks where the applicant learned about the rebate programs and when completed full frequently notes the bill inserts as a key source of program information.

Local Home Builders Associations provide another strong partnership opportunity for energy efficiency messaging. These organizations play an integral part with local contractors and the new home industry to promote higher-efficiency equipment use and efficient building practices, including Built Green® certification. The Company attends Built Green meetings and events as available to further encourage uptake of program offerings and higher-efficiency natural gas investment from builders at the time when decisions are being made. HBAs commonly message to new home buyers and those interested in renovating their existing homes – which in turn, provides the Company with a premier opportunity for outreach during an association's Home and Garden Shows and Home Tours. During these events, the Company often places advertisements in event directories and at the homes themselves (see *Appendix B*). The Company will also attend such events in person to speak with customers and support local Trade Ally

Contractors by providing program materials and rebate information for distribution to attendees. These efforts will continue into 2018 and 2019 with the Tri-Cities HBA, Central Washington HBA, Skagit/Island County HBA, Home Builders Association of Whatcom County, Kitsap Building Association Membership Directory and others as deemed appropriate. Note – in Skagit and Island County the Company took a more direct approach to promoting and recommending a high-efficiency natural gas home during the 2017 SICBA home tour by remaining on site during a day of the Home Tour and discussing the efficient appliances and rebates which the home owner was eligible for as part of the Energy Efficiency programs. See *Appendix B* for excepts from the Tour Directory.

The real-estate industry also poses a unique opportunity for Company representatives to provide information about energy-efficiency offerings to an audience poised to help home buyers make wise decisions on future energy consumption in their homes. Informing real-estate agents of available rebates and the impact energy choices can make to a home's energy costs during the lifespan of the measure is important to start the purchaser on an energy efficient path as early as possible. The Company has attended Association of Realtor meetings in the past and continues to scan for additional opportunities to increase outreach to this group throughout 2018 and into 2019.

As the home owner/buyer is most frequently the decision maker in efficiency upgrade situations it's also an opportunity for the Company to provide information to the industry helping home buyers with their purchase – i.e. the financial or loan industry. The Company recognizes that one of the main barriers to installing higher-efficiency equipment in existing homes and businesses is the initial higher costs. If the Company can get information about rebates into the hands of those making the purchasing decisions it helps inform them about their options and possibly accommodate the additional higher costs at the time funding is being discussed and made available. Cascade performed some research into financing and working with banks in 2017 and will continue this outreach throughout 2018/2019.

The Company relies heavily on coordination with local area contractors to encourage uptake of its conservation programs. Contractors are on site with the customer, in their home, helping them make the decision to install either standard or high-efficiency appliances. Since contractors play such an integral role in the customer experience and decision-making process the Company therefore maintains a robust Trade Ally (TA) network and encourages these contractors to promote higher-efficiency natural gas equipment. The TA network also enables the Company to confirm most installations performed as part of the CIP conform to industry best practices meaning the install meets expectations and results in anticipated energy savings.

The Company frequently interfaces directly with contractors and builders through its Trade Ally network should questions or concerns arise. Cascade also sends periodic newsletters and emails to the contractors addressing pertinent aspects of the program including updates, quality control issues, highlighting best practices and case studies. Cascade also provides a range of Trade Ally benefits to encourage active sales of higher-efficiency natural gas equipment and measures. See *Appendix B* for an example of a trade ally bonus coupon, which provides an additional incentive to customers working directly through a qualified TA. These coupons must be submitted by a customer in conjunction with a qualifying rebate application whereupon funds are distributed directly to the customer. The TA program also provides limited cooperative marketing funding for Trade Allies along with reimbursement monies for trainings relevant to working with homes served by natural gas.

In 2017 the Company made a concerted effort to work directly with home builders to improve a bulk electronic application submission process and encourage additional residential rebates on a larger level. This direct outreach to builders has had a significant impact on therm savings and continues to grow the network of advocates for the EE programs in the contractor/builder networks through the Cascade territory. Cascade will continue these efforts and try to make the process even easier for builders to continue to install higher-efficiency natural gas measures in the majority of their homes when served with natural gas.

Low Income messaging opportunities

Cascade continues to seek opportunities for additional messaging to customers and the low-income agencies. The Company will continue to work together with the Agencies to encourage uptake of the programs. The Company circulated low-income weatherization bill inserts to generate greater program awareness in select areas in 2017, and will continue to look toward other strategies at the request of the Company's weatherization partners including public facing advertising as deemed appropriate and cost-effective.

Commercial Focus

In addition to the Company's residential outreach efforts, Cascade also tailors messaging to Commercial and Industrial customers. Outreach efforts for these customers in the past were tailored to one-on-one customer engagement and have since blossomed to a more robust effort in accordance with the cross-channel marketing mentioned earlier. For the past several years, Cascade has been a sponsor at the Northwest Food Processors Association Energy Summit. This sponsorship gives program representatives a unique opportunity to discuss conservation options in person

and provide information directly to industrial customers who can otherwise be difficult to reach.

The Company also sponsored the 2017 Washington Energy Future Conference where we displayed messaging about the program in the directory. This event plays a key role in promoting energy efficiency throughout the state to industry decision makers and the public. See *Appendix B* for a sample of the ad.

Additionally, the Company has made a concerted effort in 2017 to highlight successful installs and promote these customers and their accomplishments through case studies and large check presentations. These types of promotions provide a cost-effective venue to achieve press coverage and promote the program through best-practice examples. See *Appendix B* for copies of case studies created this year as well as promotional material distributed throughout the territory based on the case studies and check presentations.

The Company regularly attends and tables at Chamber of Commerce events including annual meetings, business expos and monthly meetings to distribute commercial/industrial messaging, and will continue to do so in the following years as opportunities arise. In the past year and moving forward Commercial program promotion material has also been placed in Chamber monthly newsletters, business directories and Trade Organization websites and annual publications where prudent. See *Appendix B*.

Lockheed Martin, the Company's Commercial program implementation vendor increased its outreach efforts on behalf of the Cascade CIP in the past year and is positioned to continue to further increase these efforts into 2018. One aspect of this effort includes an update to the branding guidelines to help the consumer identify program material at a glance which allows the message to more easily be interpreted and correlated with the EE program outreach.

The Lockheed team attends and tables at events as needed to provide information about Commercial and Industrial program offerings and requirements. The Cascade team is also working with Lockheed to develop a more robust major account management approach to reaching out to the Commercial/Industrial customers. The program will continue to move forward with its outreach strategy into 2018 and is looking for opportunities to branch into alternative messaging potentially including billboards, additional commercial focused radio spots, YouTube advertising, video case studies and social media.

Online

In CY 2018 the Company is planning to take a critical look at its Conservation Corner microsite and evaluate opportunities to make it more effective and user friendly to customers seeking EE information within the existing budget. With the push for more aggressive growth of the Energy-Efficiency program a robust online presence is expected and critical to increasing uptake. The goal would be to eliminate friction in the customer experience for learning about the energy-efficiency program and applying for rebates. Some of the potential areas for improvement include:

- Improved searchability from the CNGC.COM main website
- An ability to verify equipment qualifications before applying for a rebate (qualifying measure list)
- A more modern impression when on the page
- Improved Search Engine Optimization
- Increase visits per day traffic
- Yield consistent results with keywords: rebate, energy, efficiency, incentives, etc.
- Lower Bounce rate
- Accessibility improvements from desktop, laptop and mobile devices

The company is exploring new opportunities in online campaigns and social media marketing. While the Conservation Department has posted online advertisements in the past, the parent company is charged with social media management. The company is planning to work more closely with its parent company to influence and potentially create posts about program offerings for our internet-savvy customer audience.