CASCADE NATURAL GAS CORPORATION®

A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

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Introduction

Cascade Natural Gas Corporation (the Company or CNGC) has developed this Plan in consultation with its Conservation Advisory Group (CAG) as a roadmap to the 2019 and 2020 near term conservation strategy for reducing energy consumption through its Energy Efficiency (EE) Programs.

This fourth iteration of the Conservation Plan is intended as a companion planning document to the Demand Side Management (DSM) section of the Company's 2018 Integrated Resource Plan (IRP). Each document highlights the following areas of DSM:

Energy Efficiency within the IRP:

1. An executive summary of the forecasting potential for the Company's energy-efficiency efforts, under a 20-year horizon
2. 2018 Cascade Natural Gas Corporation Conservation Potential Assessment performed by Applied Energy Group (AEG).
3. Incorporation of the Company's EE efforts as a meaningful resource toward meeting future demand
4. Discussion including environmental externalities, regional and local energy planning as well as potential legislative impacts

Conservation Plan:

1. Focuses on potential and near-term conservation program planning
2. On the ground program implementation updates
3. Regional efforts to improve market transformation
4. Scenarios for annual forecasting run through the Company's potential forecasting tool (also available in the IRP)
5. Outreach efforts and community engagement

CNG's Conservation Plan discusses the potential savings determined for the Cascade Natural Gas Corporation (CNGC) Washington service territory through the Company's LoadMAP (Load Management Analysis and Planning) modeling tool provided by AEG. To parallel the format of Conservation Plans provided by other utilities in Washington State, this document demonstrates the Company's immediate (two year) conservation goals as well as the 10-year forecast of savings.

The Company approached the 2018 Calendar Year as an opportunity to further refine its growing Energy Efficiency Incentive Programs (EEIP). Key motivators included reportability of program accomplishments, improved data analytics, real-time insight into program

development and a commitment to seeking synergies through coordination with regional partners. These changes included a consistent drive for efficiencies through process improvements, greater transparency in EEIP data sets combined with improved granularity through program reporting; longer reaching outlooks on potential planning: and strategic process development and consistent improvements to software in support of the in-house residential rebate processing. Groundwork set in place in 2017 through internal delivery of residential programs has empowered the Company to perform extensive analysis of program trends, barriers and opportunities which has supported an increase in residential savings far beyond previously experienced levels. Calendar year 2018 also provided CNGC with a more nuanced and updated understanding of available Conservation Potential throughout its territory through a new Conservation Potential Assessment (CPA). The Company, meanwhile continued to learn and incorporate the best practices of its peers throughout the Northwest. As Cascade moves into 2019 it is focusing on further business development opportunities highlighting energy efficiency choices for its customers. The Company is also focusing on synergies between its districts' efforts and those of energy efficiency staff to target major accounts and new construction through the multi-home builder cohort to increase collaboration and drive program uptake.

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 (WUTC or 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 natural gas appliances, insulated doors, ventilation heat recovery systems and various other commercial/industrial equipment upgrades. By prompting rate payers through energy efficiency outreach to reduce their individual demand for gas, Cascade can supplant the need to purchase additional gas supplies; displace or delay contracting for incremental pipeline capacity; and possibly negate or delay the need for reinforcements on the Company's distribution system. It's also essential to recognize the Company can encourage customers to reduce their consumption to aid load management, but it's ultimately the choice of the end user to manage consumption by recognizing an inherent value in energy efficiency.

There are two basic types of demand side resources: base load resources and heat sensitive resources. Base load resources offset gas supply requirements throughout the

year, regardless of the weather and outside conditions. Base load DSM resources include measures like high efficiency water heaters, higher efficiency cooking equipment and ozone injection laundry systems. Heat 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 heat sensitive DSM measures include ceiling, floor, and wall insulation measures, high efficiency gas furnaces, and improvements to ductwork 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 base load supplies.

Program Goals & Budgets at a glance

Table 1: EEIP Goals 2019 & 2020

	Calendar Year 2019				Calendar Year 2020			
	Residential	Commercial/ Industrial	Low Income	Total	Residential	Commercial/ Industrial	Low Income	Total
Admin Budget[1]	$924,186	$1,261,274	$25,568	$2,211,028	$952,000	$1,300,000	$26,500	$2,278,500
Therm Targets[2]	333,424	370,587	15,000	719,011	369,466	437,271	16,000	822,737
NEEA Natural Gas Market Transformation				$548,804				**TBD**

[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 LoadMAP modeling tool. Calendar Year 2020 targets will be revised through the 2020 Conservation Plan as part of the annual planning process.*

Performance Comparison

Company therm savings achievements for the past two years compared to the 2012 IRP and the 2014 IRP goals are in Table 2 inclusive of the next two years' worth of goals (2017 and 2018) to demonstrate what the Company is striving toward. Totals for 2018 accomplishments will not be available until the annual report is filed in June 2019. Note, despite the lower actuals to goals for the 2016 IRP biennium, therm savings continued to grow by 11%, a reflection of the Company's reach toward increasing targets. Furthermore, the Company's 2019-2020 biennium targets aim to boost energy savings proportionately higher, by 13% independent of historic achievements.

Table 2: Recent IRP Goal to Actual Therm Accomplishments

Years	BIENNIUM	GOALS	ACTUALS	DIFFERENCE	GROWTH
2013	**2012 IRP**	1,077,661	1,113,046	**+3%**	**-11%**
2014					
2015	**2014 IRP**	1,204,469	1,225,315	**+2%**	**+10%**
2016					
2017	**2016 IRP**	1,456,143	***1,358,955****	***-7%****	**+11%***
2018					
2019	**2018 IRP**	1,541,748	**TBD**	**TBD**	**+13%***
2020					

*2018's final actuals are not yet available. This number is based on the year to date figures through the end of October, and then extrapolated to provide what 2018 is tracking towards by year end if therm savings continue to accumulate at the same rate. This is not the official savings achievements for the 2017-2018 biennium.

Budgeting Parameters

The Company is providing the following 2019 detailed estimated budget to clarify elements included under the Direct Benefit to Customers (DBtC) allocation versus those allocated as administrative costs to implement the program. For comparison to last year's budget the Company is also including the 2018 budget table in the Appendix.

Table 3: Program Budgets

Program Budgets - Reflected in the 2019 CNGC Conservation Plan			
Incentive Estimates			
Program	**Budget**	**Allocated as DBtC**	**Notes**
Residential	$1,920,000	√	See Residential section
Commercial/Industrial	$950,000	√	See Com/Ind section
Low Income	$515,000	√	See Low Income section
Total Incentives	**$3,385,000**		
Non-Incentive/Program Implementation Expenses			
Program	**Budget**		**Notes**
Residential	$924,186		Staffing, software, marketing
Commercial/Industrial	$1,261,274		Third party program management with commercial marketing, remainder toward internal support and program coordination
Low Income	$25,568		Marketing, training, supplies
Portfolio Admin Total	**$2,211,028**		Residential, Com/Ind, & LI Weatherization

Non-Incentive Expenses Allocation:	Budget	Notes		
Labor	*$683,047*	Company staff allocated 70% residential/ 30% Commercial/ Industrial, minor low-income hours + part time cyclical temporary assistance for application processing		
Third Party Commercial/ Industrial Program Mgmt.	*$904,750*	Implementation, outreach for C/I EEIP, total for contractor coordination is dependent on vendor goal achievement		
Annual Software fees	*$185,000*	Residential & Low-Income rebate processing and data management, TA Program, maintenance and updates		
Outreach / Trade Ally	*$288,100*	**Breakdown**	**Allocated as DBtC**	**Notes**
		$20,000	√	LI Weatherization Outreach
		$68,800	√	Bonus coupons delivered by TAs to customers & Quality Control Inspections
		$5,500	√	Residential Program partnership with local community energy programs partnerships, e.g. Sustainable Living Center, Community Energy Challenge
		$3,000	√	Partnership with local Commercial energy program: Sustainable Connections
		$4,000	√	Customer Service Resolution
		$97,000		Trade Ally Support
		$25,000		Professional Dues, e.g. AESP, WA Lodging and Restaurant associations, HBAs, etc.
		$10,800		Display materials & handouts
		$54,000		Outreach: Campaigns, Web, etc.
Other	*$150,131*	$108,500		Miscellaneous & General Operating Expenses
		$24,723		Travel
		$10,190		Professional Development
		$6,718		Office supplies
Portfolio Admin Total (Included from above)	**$2,211,028**	Non-Incentive/Admin Expenses		
Additional Expenses *(excluded from DBtC)*	**$548,804**	NEEA Market Transformation		
Total Expenses	**$6,144,832**	Program Delivery + Incentives + NEEA		

Cascade set an administrative budget to plan and operate programs under the avoided costs shown in Appendix H of the IRP. This budget must ensure an acceptable ratio of costs balanced with therm savings achievements. Since therm savings offset the costs of administrative investment, the greater the achievement, the more cost-effective the programs. If the budget or therm savings upon which the portfolio is built are unrealistic, the Company risks 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 geared toward a conservative approach when establishing administrative budgets and estimating costs. In practice, the Company frequently sought to decrease administrative costs to offset lower avoided costs and maintain as robust a program portfolio as feasible. In the new realm of increased savings goals and higher conservation, the Company took a close look at areas where it could invest more heavily to meet those goals by further encouraging uptake.

As part of the planning process various benefit-cost ratios were modeled to maintain a reasonable administrative budget and protect the EEIP's cost-effectiveness. The Company explored options at the portfolio level to determine which types of fiscal measures could be taken, and to what degree, for each program type in the unlikely event an unexpected cost is incurred, or economic conditions significantly vary from assumptions, or participation levels do not meet revised ramp rates. For 2019, the portfolio level buffer for cost-effectiveness equates to approximately $1.7 million, split between Commercial and Residential programs, indicating the Residential program could support a difference of up to $1.1 million and the Commercial $600,000 respectively and still not threaten the portfolio cost effectiveness.

However, it is important to note while cost-effectiveness may be maintained so long as programs operate within the above budget parameters, the DBtC would be impacted depending on the proportion of funds spent on rebates or administrative costs. To that end, the Company will continue to carefully balance additional spending in a manner that maintains cost-effectiveness and strives for a higher DBtC.

Meanwhile, the Company continues to monitor the impacts of changing natural gas prices and avoided costs to the EEIP's budgetary options.

Additionally, the Company recognizes WUTC staff have directed as part of its Annual Report review that the Company is to achieve its targets and Cascade will make every possible effort to meet the goals, as noted in this 2019 Conservation Plan.

Direct Benefit to Customer Ratios

In January of 2017 Staff from 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 administrative program expenses. The Company identified a 57% DBtC estimate for its programs through the 2017 budget and was asked in future years to aim for a minimum of 60% DBtC. Cascade worked with its Conservation Advisory Group (CAG) and with Commission Staff to realign program rebates to provide a higher percentage of rebates and benefits to customers than other program expenses in the second half of 2017. The annual report results noted a DBtC of 56%. Efforts to further sway the proportion of benefits to customers in the second half of 2017 and throughout 2018 included increasing rebates, additional promotion of bonus coupons for customers to use knowledgeable Company Trade Allies and overall increases to numbers of customers served.

Per WUTC direction DBtC ratios 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 are broken into the following categories:

Table 4: Direct Benefit to Customer Expenses

Cascade Natural Gas - 2018 DBtC Category Clarifications		
	Direct Benefit	**Program Delivery**
Residential	• Rebate payments • Bonus coupons to customers for using qualified TAs • Quality Control Inspections • Partnerships with local energy programs promoting the EEIP by assisting customers to qualify and apply for rebates • Customer Service Resolution	• Labor • TA program materials • Cooperative marketing & training reimbursement, • TA outreach • Residential EEIP ad placement • Software access fees • A portion of organizational dues • Travel expenses associated with program delivery • Seminar and training attendance • Miscellaneous operating expenses
Commercial & Industrial	• Rebate Payments • Partnerships with local energy programs promoting the EEIP through customer engagement	• Third party program management inclusive of commercial marketing efforts • Internal staffing & oversight from CNGC • A portion of Trade Organizational dues • Travel expenses for program delivery • Seminar and training attendance • Miscellaneous general operating expenses

Low income	• Customer Rebates for Low Income weatherization services • Promotion of the LI Programs to eligible customers to steer them to LI Agencies	• Program staff administration • Travel expenses for program delivery to agencies

The Company will strive to reach this metric of success as noted in the DBtC Table 5 yet notes there are certain elements of Cascade's territory which make a 60% ratio of benefits to costs difficult to maintain.

- 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.
- Meanwhile, the programs have 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 CNGC territory is mostly rural and widespread (compared to other natural gas providers in Washington State) requiring additional administrative effort and funds to significantly impact the territory without an ability to take advantage of advertising through economies of scale.
- The Company is not a dual fuel provider so does not have the same opportunity to leverage existing efforts as can be found with other utilities within the state.

Table 5: 2019 DBtC

DBtC – Cascade Natural Gas 2019 Conservation Budget			
	Direct Benefit to Customers	Other Costs	Total Utility Costs
Residential	$1,998,300	$845,886	$2,844,186
Non-residential	$953,000	$1,258,274	$2,211,274
Low income	$535,000	$5,568	$540,568
NEEA	$548,804		$548,804
Total			$6,144,832
Portfolio Ratio	**62%**	**38%**	

*For gas programs, NEEA is excluded from the total budget DBtC ratio

Integrated Resource Plan's Energy Efficiency Two-Year Action Plan

In the *Cascade Natural Gas Corporation Draft 2018 Integrated Resource Plan*[1] the Company committed to the following DSM efforts to support long-term program achievement goals:

- Perform continual technical review of new measures identified by the AEG CPA as well as through participation in the Gas Technology Institute Emerging Technology workgroup for inclusion in the Energy Efficiency program portfolio
    - This will allow the Company to determine whether the technology is available to installers within Cascade's service territory as well as enabling updates to incremental/install costs as applicable
- Review and revise ramp rates within the LoadMAP model in compliance with best practices as recommended from the NWPCC and AEG, to align with measure maturity
- Increase builder outreach
- Partner with Cascade Districts and operations teams to increase customer awareness of Energy Efficiency programs through daily interactions
- Extend Northwest Energy Efficiency Alliance (NEEA) membership into Cycle 6 (2020-2024) and elevate CNGC's participation to equal status with electric and dual fuel utilities on the Board of Directors allowing regional natural gas market transformation efforts to grow
    - Fully engage in NEEA's Next Step Homes program starting in 2019 to support the Company's expanding residential builder outreach efforts
- Expand Commercial/Industrial program outreach and customer engagement
    - Host customer forums
    - Identify opportunities for dual fuel solutions
    - Expand SPIF offerings
    - Provide selective technical audit support
- Enhanced Trade Ally (TA) engagement
    - Drive Trade Ally participation through the commercial program with the primary objective being to make the incentive program a simple part of the install process for all Trade Allies in the Company's network installing in commercial/industrial properties and second, to increase the network where gaps exist
    - Provide CNGC Sponsored TA training for underperforming measures including air sealing and potential duct sealing if added to the portfolio

[1] Cascade Natural Gas Corporation 2018 Integrated Resources Plan (UG-171186)

    - Expand a Point of Sale offering to residential Trade Allies to remove upfront cost barriers for customers to install higher-efficiency upgrades
- Explore geographic pilots and efforts for specific offerings to underperforming areas within the service territory – for example in Zone 2 (Aberdeen, Longview, etc.)
- Increase engagement with the agencies delivering the Company's LI Weatherization Incentive Program for the purpose of facilitating increased weatherization services delivered to qualified natural gas customers in Cascade's service area
    - In addition to regular communication by phone and email, the Company will meet with the agencies in-person at least once a year, beginning in October 2018. The purpose of the Company's in-person meetings with the agencies will be to ensure effective coordination and to provide ongoing support to agencies to help meet their goals
    - Continue to ensure careful review and verification of program costs as the $10,000 per project cap on weatherization spending is removed, and tariff-approved funding is expanded
    - In addition to estimated project completion targets, the Company shall also give agencies the opportunity to include a budget estimate in its Memorandum of Understanding (MOU) to provide additional assurance to these partners that funds will be available as needed. This is consistent with the program tariff which does not set a cap to the maximum amount of funds available to agencies as rebates during the program year
    - Continue to maintain open communication with agencies regarding potential barriers to serving natural gas homes and determining which can be overcome in coordination with the Company
    - Keep apprised of home energy auditing techniques and make adjustments to allowed methodologies as new best practices emerge in the state

Many of the sections addressed within the Conservation Plan tie directly to this Two-Year Action Plan from the IRP. This aligns with the purpose of the Conservation Plan which is to serve as a companion planning document on *how* the Company will deliver its energy efficiency programs to meet the commitments as they arise from the forecasting performed as part of the IRP process.

2018 Applied Energy Group CPA

As of 2014 the Company discontinued use of its first potential assessment study by Stellar/Ecotope and adopted an updated model and CPA performed by Nexant Inc. This revised study was the first step toward the Company obtaining a more nuanced

understanding of its conservation potential. This groundwork allowed further refining of targets and portfolios than had previously been available 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 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 of natural gas energy efficiency for customers on Washington Rate Schedules 503, 504, 505, 511, & 570 (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 to inform future program design. The study also integrated an evaluation and measure savings review of Cascade's conservation portfolio through use of a customized Microsoft Excel-based modeling tool, TEA-Pot (Technical/Economic/Achievable Potential).[2] This modeling tool was built on a platform that supported running multiple scenarios and re-calculating 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 TEA-Pot allowed the company to calculate potential internally through a third-party tool evolution of regional energy efficiency programs and processes found the methodology employed through the program no longer aligned with that of other LDC's within Washington State. In 2017 the Company released a Request for Proposal (RFP) as per its commitments from the 2016 IRP's addendum[3], to qualified independent evaluators of Energy Efficiency programs seeking a comprehensive reassessment of the Company's Residential, Commercial and Industrial energy efficiency potential 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

[2] 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
[3] The addendum was filed March 10, 2017, in Docket No. 160453.

horizon.[4] Three vendors responded to the RFP and AEG was awarded the contract. AEG worked with the Company and its CAG throughout the heating season and provided the finished product at the completion of Q1 2018.

AEG's modeling framework tool, LoadMAP was developed as an end-use load forecasting model to allow estimation of conservation potential, built in Microsoft Excel and tailored to meet the needs of the client. Due to the scalable nature of the model it allows utilities to analyze potential for a combination of market sectors, segments, climate zones, end uses, technologies and measures.

Tasks in the study included 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 projecting the baseline. The user is then able to calculate the potential analysis under updated ramp rates influenced by available Regional Technical Forum data. One of the key areas of improvement in the revised model included the ability for the company to ascertain its Achievable Technical potential as well as its Economic Achievable potential using multiple cost tests at the same time, under a single run. See the Targets Developed through LoadMAP section for further discussion. The full study, description of the process and CPA are included within Appendix D in the Company's 2018 IRP[5].

Portfolio of Measures

Conservation program offerings are affected by fluctuations in natural gas prices reflected in the Avoided Costs. Appendix H of the IRP houses the adopted Avoided Costs, which declined from the previous IRP. This decline is more pronounced in the long-term, for longer lived measures (30-45 years), than for the mid-range of measures' lives (10-20 years). The Company's portfolio average measure lives hover around 20 years, sometimes more and sometimes less. Resulting in a less pronounced effect from the new avoided costs ($9.03 for 2018 instead of $11.59) for the whole programs' benefit-cost ratios. It's the longer-lived measures like insulation where the impact accumulates and is felt stronger ($30 versus $15). The reason the Avoided Costs calculations experience less of a decrease in the earlier years for the 2018 figures than the later years, compared to 2016, is attributable to a couple factors. First Transport accounts for a major part of the avoided costs since the costs from new projects don't

[4] Cascade Natural Gas Corporation Energy Efficiency Potential Assessment & Modeling Software Tool for CNGC Washington Territory, Request for Proposal 07/11/17.
[5] Cascade Natural Gas Corporation 2018 Integrated Resources Plan (UG-171186) CPA, Appendix H, page i

come into play until a shortfall is identified. Second the gas forward markets had been historically low, and with the commodity price being such a heavy portion of the avoided costs, it pushed the numbers down at the time the Company locked inputs to run the final scenarios.

A decrease in the cost of gas makes it difficult to maintain robust conservation portfolios as a utility, whereas gas price increases make conservation efforts more viable from a benefit-cost analysis. The Company continues its commitment to offering meaningful conservation programs to help drive customer decisions toward higher-efficiency appliances and upgrades and use of the revised model available from AEG is integral to developing these programs. Other elements pertinent to development of measure portfolios include the types of cost tests run, the inputs included within the model and ramp rates associated with each measure type.

In the Addendum to the 2016 IRP Action Plan referenced earlier in this narrative, the Company committed to working in collaboration with the CAG to evaluate its programs not solely through the lens of the Utility Cost Test (UCT) but also toward using the Total Resource Cost (TRC) in its Conservation Plan and Annual Report. The company has since incorporated the TRC in its revised model in addition to the UCT and is reporting achievements under both parameters.

Using the Company's 2019 proposed budgets and goals the UCT benefit cost ratio is estimated on the portfolio level to be 1.35 (1.2 for Residential and 1.5 for Commercial/ Industrial) and have a 1.1 TRC (1.0 for Residential and 1.3 Commercial/ Industrial). These estimates assume the Company achieves all targets. 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.

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

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."[6]

The Company's approach to calculating cost-effectiveness reflects guidance from the UG-121207 Conservation Policy Statement. The Company held multiple discussions with its CAG related to the policy statement, and ultimately moved towards the UCT as its primary valuation metric, with TRC as its secondary (both of which are included in the plan and annual reports). This 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.

Thus, the UCT is the Company's 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.

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 which is addressed later in this narrative.

Cost-Effectiveness Testing and Program Design

As of the latest IRP, Cascade can pursue a combined Residential and Commercial/ Industrial conservation portfolio with a cost-effectiveness limit of $0.80 per therm.

Utilizing the UCT, rebate thresholds were set to achieve an optimal balance between driving program participation towards higher targets through persuasive incentive levels while maintaining cost-effectiveness and ensuring a broad menu of offerings. The proposed program incentive levels were reviewed with the CAG, most recently in October of 2018, and upon further analysis, resulted in the proposed program offerings referenced here and planned for early 2019.

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

In addition to the impacts from Avoided Costs and various cost-effectiveness tests, in 2014 the Company discussed with its CAG and Commission Staff the continuation of tying the Long-Term Discount Rate to the Weighted Average Cost of Capital (WACC), which lowered cost-effectiveness and thus the incentive amounts the Company could entice customers with, in turn lowering the therm savings potential. To allow longer-lived measures to continue to thrive within its portfolio and prevent reductions and/or slowed momentum the Company tied it's DSM long-term discount rate to the average 30 Year Mortgage Rate, 4.43% for the 2018 IRP and this Plan. For context, an increased or higher discount rate lowers the therm savings potential while a lower discount rate raises the potential savings. Internal discussion since 2014 have also explored elimination of a discount rate on energy efficiency. Through the Company's participation on the NEEA Cost-Effectiveness committee and the Statewide Advisory Group (SWAG) on incorporation of a Resource Value Test (RVT), the Company is keeping abreast of how other LDCs and regional partners are applying discount rates and may explore revision of the discount rate in the future.

Industry standard cost effectiveness tests are performed to gauge the economic merits of the portfolio within the Company's LoadMAP model. Additionally, AEG incorporated placeholders for the RVT into LoadMAP alongside the UCT and TRC to allow future valuation under this regionally evolving metric. AEG provided the following definitions of each test applied to the final forecasts, per the recent CPA:

> ***UCT Achievable Economic*** *Potential further refines achievable technical potential by applying an economic cost-effectiveness screen. In this analysis, primary cost-effectiveness is measured by the utility cost test (UCT), which assesses cost-effectiveness from the utility's perspective. This test compares lifetime energy benefits to the costs of delivering the measure through a utility program, excluding monetized non-energy impacts. These costs are the incentive, as a percent of incremental cost of the given efficiency measure, relative to the relevant baseline course of action (e.g. federal standard for lost opportunity and no action for retrofits), plus any administrative costs that are incurred by the program to deliver and implement the measure. If the benefits outweigh the costs (that is, if the UCT ratio is greater than 0.9), a given measure is included in the economic potential. Note that we set the measure-level cost-effectiveness threshold at 0.9 for this analysis since Cascade is allowed to include non-cost-effective measures as long as the entire portfolio is cost effective. This is important because a portfolio considers more than just energy savings. Cascade may include popular measures that are on the cusp of cost-effectiveness, accommodate variance between climate zones, maintain a robust*

portfolio, or include a measure that improves customer outreach and communication.

***TRC Achievable Economic** Potential is similar to UCT achievable economic potential in that it refines achievable technical potential through cost-effectiveness analysis. The total resource cost (TRC) test assesses cost-effectiveness from a combined utility and participant perspective. As such, this test includes full measure costs but also includes non-energy impacts realized by the customer if quantifiable and monetized. In addition to non-energy impacts, we assessed the impacts of non-gas impacts following Council methodology. This includes a calibration credit for space heating equipment consumption to account for secondary heating equipment present in an average home as well as other electric end-use impacts such as cooling and interior lighting as applicable on a measure-by-measure basis. As a secondary screen, we include TRC results for comparative purposes were included.*

***RVT Achievable Economic** Potential is similar to the UCT and TRC achievable economic potential but assesses cost-effectiveness from a regional perspective. The resource value test (RVT) reframes the analysis around accomplishing a jurisdiction's regional policy goals and includes hard-to-quantify impacts through quantitative or qualitative approaches. This test allows jurisdictions to define policy goals which may include additional impacts beyond the traditional utility-customer TRC approach. In May of 2017, the National Efficiency Screening Project (NESP) released a National Standard Practice Manual (2017 NSPM) which details an approach for conducting screening measures under the RVT. AEG assessed preliminary estimates of potential under the RVT as part of this study, but since policy goals are defined at the regional level under this test, we are awaiting recommendations on non-energy impacts and values from the Washington Utilities and Transportation Commission (WUTC). The model has been configured to accommodate these future updates as they become available."* [7]

This plan ran scenarios under the UCT, TRC and RVT, however, the company maintains the best test for maximizing potential therm savings is the UCT since it treats the rebate as a leveraged partnership that drives positive market change.

[7] Per the 2018 CPA, Volume 1, Page 7

Incentive Level

As of June 30, 2017, the Company increased many of its EEIP rebate levels to encourage additional uptake where cost-effective, and in turn, proportionally increase the amount of incremental costs covered by the rebate. For CY 2018 the Company sought to develop a more custom approach to setting incentive levels through its new LoadMAP tool. The intention is to adjust incentives to maximize individual measure uptake, rather than a basic 30 or 50 percent of incremental cost standard as previously established. On an individual basis, the Company took a more critical look at each measure's current rebate and increased the incentive where cost effective at the measure and portfolio levels. Additionally, the Company looked at whether uptake on that measure had been slow, i.e. below levels reflected in the revised ramp rates available for use in the new forecasting model to leverage all potential savings. The approach from 2017's incentive increases yielded significantly increased participation as experienced in the Residential programs, when coupled with other program enhancements to customer service and development of a Builder Program, discussed later. The Company will continue to evaluate further viability of incentives at portfolio levels as it finalizes the proposed rebate updates. This approach is expected to continue to drive the Company towards the target DBtC ratio of 60/40 or 1.5 Benefit to Customer versus programmatic costs, as set by the WUTC.

Program Offerings

All items offered at the time of this writing (November 2018) 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. Thus, the 2018 Annual Report filed with the Commission in June 2019 will reflect the assumptions from Nexant's CPA and the 2016 IRP, while new offerings and findings from the AEG CPA will be reflected in the 2019 tariff filing for updated rebates and the 2019 Annual Report, released in June 2020.

A current incentive list of measures and their corresponding rebate offerings is available in Appendix A for the Residential and Commercial/Industrial programs.

Program Updates for 2019

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 most recently acknowledged avoided costs.

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. To ensure the Company's DSM offerings stay current, Cascade engages in annual reviews 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 EEIP 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 meaningful energy savings. 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 through the Gas Technology Institute and NEEA, discussed later. The Company also continues to make progress on this front thanks to the reassessment of the Company's conservation potential.

Tables 6 and 7 provide 2019 proposed changes to the Residential and Business portfolio offerings. Note, the Business program also offers custom rebates:

Table 6: Residential Program Proposed Changes

Legend
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decreased
no change
increased

NEW HOMES	CURRENT REBATE	PROPOSED REBATE	OLD UCT	OLD TRC	NEW UCT	NEW TRC
Built Green Certified Home	$2,000	$2,000	1.9	5.2	1.2	1.8
ENERGY STAR® Certified Homes + U.30 Window Glazing	$2,000	$2,000	1.8	5.1	1.1	1.6
EXISTING HOMES	**CURRENT REBATE**	**PROPOSED REBATE**	**OLD UCT**	**OLD TRC**	**NEW UCT**	**NEW TRC**
Attic/Ceiling Tier I - R38	$0.75	$0.75	2.6	2.4	1.2	1.1
Attic/Ceiling Tier II - R49	$1.00	$1.00	2.4	2.8	1.1	1.3
Wall Insulation	$0.75	$0.75	2.9	1.6	1.4	0.8
Floor Insulation	$0.75	$0.75	2.4	1.4	1.1	1.6
Whole House Residential Air Sealing	$100.00	$150	2.3	0.8	1.3	0.6
Windows	**New**	$5/sq. ft.	**Not applicable**		1.7	0.5
Duct Sealing	**New**	$150	**Not applicable**		1.6	0.5
Duct Insulation	**New**	$0.50/linear ft	**Not applicable**		1.3	1.4
ALL HOMES	**CURRENT REBATE**	**PROPOSED REBATE**	**OLD UCT**	**OLD TRC**	**NEW UCT**	**NEW TRC**
Combination System (changed from 90 to 95 AFUE)	$2,500	$1,250	1.9	3.0	1.2	1.8
Boiler (decreased measure life 45 to 30 yrs.)	$500	$750	5.1*	2.8*	1.1	1.6
Tankless Water Heater (adding tier: 0.87 & 0.93 UEFs)	$250	$250 & $350	1.7	0.5	1.2 T1 1.1 T2	0.4 T1 0.5 T2
Water Heater	$45	Removed	1.1	1.3	**Not applicable**	
Energy Savings Kit 1	$10	$20	2.1	0.8	1.2	0.6
Energy Savings Kit 2	$16	$40	2.2	1.3	1.2	0.5
Programmable Thermostat	$10	$25	2.1	4.6	1.8	3.9
Exterior Door	$100	$100	1.8	1.2	1.1	0.7
Furnace (95 AFUE min)	$400	$400	2.0	1.3	1.2	0.7
Hearth/Fireplace (moving to single tier 70 FE+)	$250 & $300	$300	2.0	1.7	1.2	1.1

* No Boiler rebates were paid until 2018. Calculation reflects low proportional contribution to savings.

Summary of Proposed Residential Changes

The Company compared its current offerings and rebate levels with other regional LDCs. The results were presented to the CAG in October 2018.

New Home Measures

The Company is considering adding a second tier for the Built Green® new home certification at 4+ stars versus 3 or less stars. Deeper analysis of the potential differences in therm savings has begun and will conclude in CY 2019. In addition, the Company is tracking NEEA's Next Step new home energy efficiency program, as discussed in the NEEA section.

Existing Home Measures

The Company is leaving residential insulation measure incentives at their current levels as they remained cost-effective despite the lower Avoided Costs and positively drove performance higher in 2017 and 2018, which the Company seeks to maintain. Meanwhile, Whole House Air Sealing has had minimal uptake despite program requirement updates in 2017, thus an increase is proposed to this rebate to see if it will help promote participation. Additionally, the program is proposing the addition of Windows, Duct Sealing, and Duct Insulation measures:

- Windows have been a frequent customer request and the Company expects the interest to translate into therm savings early in 2019. However, a Trade Ally network of window installers will need to be developed to support the measure's inclusion in the portfolio.
- PTCS Duct Sealing had been an offering in previous years when coupled with a furnace rebate. At this point the program can support adding the measure back into the portfolio without simultaneously requiring a new furnace install.
- Duct insulation is a new measure LoadMAP demonstrated as cost-effective. Upon further research, two alterations were made to the LoadMAP assumptions. The first being the measure life which LoadMAP indicated was 20 years, manufacturers promote as 100 years, and Company existing weatherization measures indicate closer to 45 years. Internal review settled on a 30-year measure life for duct insulation. Second, LoadMAP provided assumptions per square foot as a unit of measure, rather than by linear foot. Internal research was conducted into the average circumference of a duct to translate the square foot assumptions into linear feet. Results indicated the average circumference of a

duct could be estimated at eight inches, thus a 2.1 square foot to one linear foot ratio was adopted.

All Home Measures

The results from the AEG CPA included changes to some of the deemed therm savings assumptions in the Company's measure library, a summary of which is provided in the AEG CPA Library section's discussion. The most impactful of these changes to deemed therm savings was to the Combination System measure. In response, the Company raised the efficiency rating from 90 to 95 AFUE (Annual Fuel Utilization Efficiency) to maintain the offering and reduced the rebate by half. Other updates include:

- Decreased the Boiler measure's life from 45 to 30 years. However, this measure has experienced slow uptake, thus the incentive has been increased to spur participation.
- The Tankless Domestic Hot Water (DHW) Heater's efficiency ratings have been updated from Energy Factor (EF) to Uniform Energy Factor (UEF). In addition, a second tier was created to reflect the fact that participants seem to be installing even higher efficiency options than what was currently being incentivized for, thus the Company had an opportunity to push the market transformation to higher efficiency levels. The original equivalent UEF version of the Tankless DHW Heater's rebate is remaining the same while the new, higher tier offers an additional $100.
- Conventional Natural Gas Water Heaters are being removed from the program after extensive research and analysis. While the Company aims to maintain a robust menu of offerings and obtain all cost-effective therms available, it recognizes the Conventional Water Heater measure offering frequently causes customer dissatisfaction. With the conventional water heater rebate removed, customers may be disappointed not to find a rebate offered for that piece of technology, however, three quarters of the applications submitted for this measure have been denied, primarily because the efficiencies do not meet the program's 0.67 EF requirement. Additionally, many of these models are self-installs, which are not supported through the EEIP. Processing denied water heater applications amounts to more than 40 hours of staff time, or one week of an FTE per year. At this point, alternative efficiencies are not economically viable to achieve anticipated therm savings. Meanwhile, customer feedback suggests the rebate amount of $45 is not sufficient to drive a higher efficiency install compared to the cost of the .67 EF installation. Finally, conventional water heaters have contributed only 1,089 therms of savings since January 1, 2017, out of

nearly 700,000 therms combined for the residential program. The Company will monitor technological developments through its collaborative market transformation efforts for changes that would better support a Conventional Water Heater incentivize in the future, and in the meantime, will encourage higher efficiency water heating options.

- Energy Savings Kits (ESK) have been the same since 2012. The Company will use the additional funds available within cost-effective levels to update the packages. Options the Company is exploring include shower timers, weather stripping and hot water heater blankets.
- The realm of programmable thermostats is changing quickly. The AEG CPA provided two levels of thermostats in LoadMAP's model library, the standard version currently incentivized, and a second tier of Wi-Fi enabled Smart/Learning thermostats. Unfortunately, while the therm savings of the Smart/Learning thermostats are slightly higher (~10%), their measures lives are only five years compared to the standard versions' 15-year measure lives, thus the cost-effectiveness did not support a second tier. Nonetheless, the Company is increasing the rebate amount to $25 from $10, a reflection of this measures popularity, which resulted in close to 1,000 participants in its introductory year within the portfolio.
- Fireplace measures have proven difficult to process due to the Industry's inconsistent efficiency designations. The Cascade program has been unable to qualify many of the higher 80% AFUE tier models in the past few years and has found manufacturers and distributors are not providing them within the Company's service territory. Thus, to maintain a best-in-class customer service experience, the fireplace rebate is consolidating to a single tier and the new rebate reflects this update.

Table 7: Commercial Program Proposed Changes

Legend
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decreased
no change
increased

Measures whose rebates were not adjusted IN 2017	Minimum Efficiency Requirement	Current Incentive	New Incentive	Old UCT	New UCT
Hi Eff Unit Heater	Minimum 86% AFUE	$1.50/ kBtu/hr	Removed	1.59	N/a
Condensing Unit Heater	Minimum 92% AFUE	$3/ kBtu/hr	$5	1.52	1.17
Condensing Furnace	Minimum 91% AFUE	$3/ kBtu/hr	$5	1.52	1.17
Energy Saver Kit A	PRSV <=1 gpm / Aerators <=.75 gpm	$119 (value - free to customer)	$119	1.95	1.95
Energy Saver Kit B	Showerhead <= 1.85 gpm	$44 (value - free to customer)	$44	4.33	4.33
Domestic Hot Water Tanks	Minimum 91% AFUE or 91% Thermal Efficiency	$2.50 /kBtu/hr	$2.50	0.98	0.98
Tankless Water Heater	Minimum .82 Energy Factor	$60/gpm	$120	1.66	1.15
Tankless Water Heater New 2nd Tier	Minimum .93 Energy Factor	$60/gpm	$150	2.04	1.38
Motion Faucet Controls	<= 1.8 gpm, Watersense Certified	$105	$105	0.62	0.62
DHW Recirculation Controls	Add time clock or other schedule control for existing continuous operation DHW recirculation pump	$100	$200	1.67	1.30
Boiler	Minimum 90% Thermal Efficiency and 300 kBtu/hr input	$4/kBtu/hr	$6	1.67	1.37
Boiler Vent Damper	Minimum 1,000 kBtu/hr input	$1,000	$1,000	0.91	0.91
Boiler Steam Trap	Minimum 300 kBtu input and steam pressures at 7psig or greater	$125	$125	0.87	0.87
Gas Fryer-Rest	>=50% Cooking Efficiency	$600	$750	1.50	1.43
3 Pan Steamer	>=38% Cooking Efficiency,<= 2083 Btu/hr /pan Idle Rate	$850	$850	1.29	1.29
6 Pan Steamer	>=38% Cooking Efficiency,<= 2083 Btu/hr /pan Idle Rate	$1,200	$1,200	1.36	1.36
Double Rack Oven	>=50% Cooking Efficiency, <=35,000 Btu/hr Idle Rate	$2,000	$2,500	1.43	1.34
Gas Conveyor Oven	>=42% Baking Efficiency	$600	$450	0.76	0.92
Ozone Injection Laundry	Minimum 125 lb Total Washer/Extractor Capacity and Pre Approved by CNG	$2,500	$2,500	0.94	0.94
Clothes Washer	1.8 MEF	$180	Removed	0.69	N/A

Measures Whose Rebates Increased Last Time	Minimum Efficiency Requirement	Proposed Incentive	New Incentive	Old UCT	New UCT
Radiant Heating	None	$10/kBtu/hr	$15	1.63	1.36
Demand Control Ventilation	Meet JUARC Guidelines for DCV RTUs in 5-20 ton	$20 /nominal ton	$20	1.10	1.10
Tier 1 Attic Ins R 30	Tier 1 / Minimum R-30	$1.10/sqft	$2.00	2.06	1.46
Tier 2 Attic Ins R 45	Tier 2 / Minimum R-45	$1.25/sqft	$2.50	1.96	1.28
Tier 1 Roof Ins R 21	Tier 1 / Minimum R-21	$1.35/sqft	$2.00	1.98	1.57
Tier 2 Roof Ins R 30	Tier 2 / Minimum R-30	$1.60/sqft	$2.50	1.83	1.39
Tier 1 Wall Ins R 11	Tier 1 / Minimum R-11	$1.10/sqft	$1.25	1.40	1.28
Tier 2 Wall Ins R 19	Tier 2 / Minimum R-19	$1.25/sqft	$1.50	1.44	1.27
Convection Oven-Rest	>= 44% Cooking Efficiency,<= 13,000 Btu/hr Idle Rate	$500	$800	1.54	1.39
Gas Griddle-Rest	>=38% Cooking Efficiency,<= 2650 Btu/hr-sq ft Idle Rate	$500	$500	1.23	1.23
Low Temp Door Dishwasher	<=.6kW Idle Rate, <= 1.18 gal/rack	$800	$800	1.24	1.24
Low Temp Multi Tank Dishwasher	<=2kW Idle Rate, <=.50 gal/rack	$2,000	$2,500	1.56	1.40
Measures Added Last Time	**Minimum Efficiency Requirement**	**Current Incentive**	**New Incentive**	**Old UCT**	**New UCT**
Hot Fluid Pipe Insulation - 1.5" in	>140F, <200F	$4.5/linear foot	$15.00	2.99	1.72
Hot Fluid Pipe Insulation - 2.5" in	≥ 200F	$9/linear foot	$25.00	2.99	1.85
Bundle A: Any two insulation measures, min. 1,000 sqft		$500	$500		
Bundle B: Any 2 Kitchen equipment measures			$300		
Bundle C: Any 3 Kitchen equipment measures			$500		
NEW MEASURES	**Minimum Efficiency Requirement**		**New Incentive**	**Old UCT**	**New UCT**
Windows	0.27 or less U	N/A	$5/sqft	N/A	2.38
Floor Insulation	Post R > 30, or to fill cavity, pre R < 11	N/A	$0.75/sqft	N/A	1.13

Legend
removed
decreased
no change
increased

Summary of Commercial Changes

Measures that were not increased in 2017

- The Hi Eff Unit Heater's lower tier efficiency is being removed due to a lack of market availability in the Company's service territory as well as to promote higher standards of efficiency and market transformation.
- The Condensing Unit Heater, which is the higher efficiency tier of the measure noted previously, and the Condensing Furnace, have both underperformed compared to model expectations. To encourage uptake, both rebates were increased within cost-effectiveness limits.
- The ESK reflects a wording correction – the showerheads were meant to be paired with bathroom faucet aerators and the pre-rinse spray valves to be a stand-alone ESKs. The correction is also reflected in the deemed therm savings.
- A second-tier addition to the Tankless Water Heater is proposed. The efficiencies are updated to UEF and increased, along with the corresponding deemed therm savings per the LoadMAP model and AEG CPA, both of which leant themselves to the ability to offer an increased incentive, in correlation with the Residential Program's Tankless measure.
- Boilers are proving cost effective and market research from the CPA shows more potential exists. The Rebate is being increased to drive increased participation.
- Gas Fryer rebates were not increased in 2017. The opportunity now exists to offer a higher incentive for this measure as a reflection of the unique and popular Point of Sale option for kitchen equipment.
- The Double Rack Oven incentive has been increased.
- Gas Conveyor Ovens were no longer cost effective. In line with a 0.90 threshold maintained across the previous TEA-Pot and new LoadMAP models, the incentive was decreased to remain in the portfolio, with the program's total cost-effectiveness able to make up the difference to remain above 1.0.
- Clothes washers have had no uptake, and this is unlikely to improve with the incentive change that would be required to maintain them in the portfolio, so they are being removed from the program. This is the only prescriptive measure dropping off the combined portfolio.

Measures Whose Rebates Increased in 2017

- Radiant Heating has shown slow uptake and has room to increase its incentive further. The Company aims to spur uptake by providing a more meaningful rebate.

- All insulation measures are planned to increase. The Company is researching impacts to incremental and install costs vs rebate reimbursements and will incorporate additional terms and conditions to accommodate these increases.
- Convection Oven and Multi Tank Dishwasher rebates are proposed to increase, commensurate with the goal of increasing uptake.

Measures Added in 2017

- Hot Fluid Pipe Insulation was added in 2017 with two tiers. The program has not experienced sufficient uptake, so the incentives are being increased substantially to draw customers towards this opportunity to save energy.

New Measures for 2019

Windows and floor insulation are proposed additions to the portfolio for CY 2019. Floor insulation has been available on the Residential side but not for Commercial customers due to a perceived lack of eligible building types. However, the Company has identified an opportunity to target small businesses operating in premises similarly constructed to residential homes which can benefit from floor insulation. Some customers have attempted to apply for the Residential Floor insulation in the past but encountered difficulties when their rate schedules showed Commercial or Industrial. The incentive is set in alignment with that offered for the Residential program. Windows offer another cost-effective opportunity to promote a more efficient commercial building envelope.

AEG CPA Library

The AEG CPA provided an update to the equipment and non-equipment measure libraries for the Residential and Commercial/Industrial programs. It also synced 2016 customer, usage, and weather data with deemed therm savings.

The full measure libraries for all customer classes were reviewed and updates to measure lives and incremental costs were made in the 2018 CPA. Incremental cost data was pulled from historic project data with instances of two outlier price points (more than double the max value of all other data points) being removed. The changes incorporated as part of this potential enabled the Company to provide viable up to date territory specific data within the measure library to work from in developing the new model and CPA.

The base year, CY 2016 was a warm year experiencing low Heating Degree Days (HDD). This caused the Residential measures, which are more heavily weather dependent than Commercial/Industrial, to show lower than usual deemed therm savings. As the base year

was atypical AEG was able to rerun the model in 2018 with 2017 customer, usage and HDD figures and calculated higher deemed therm savings for some of the peak load measures. As a result of the CPA the Company has taken AEG's deemed therm savings for the Residential library and synced the therm savings for the measures in Table 8 using NOAA's normal weather HDDs. Note, as of November 2018 the Regional Technical Forum adopted new weather station measurement points. The Company will review and confirm these align with LoadMAP moving forward.

Table 8: Residential Deemed Therm Savings Changes

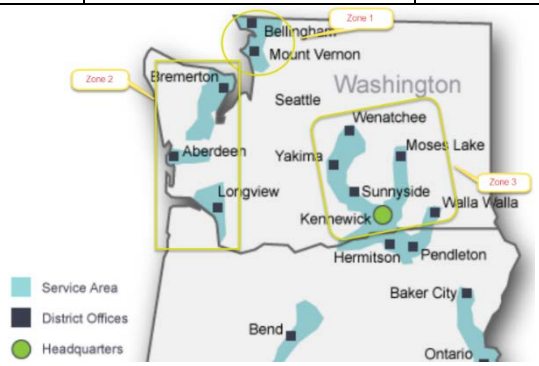
MEASURE	CLIMATE ZONE	OLD DEEMED THERMS	NEW DEEMED THERMS
Boiler*	1	106	77
Boiler*	2	106	78
Boiler*	3	106	67
Built Green	1	209	214
Built Green	2	203	195
Built Green	3	210	229
Combo System*	1	475	159
Combo System*	2	468	160
Combo System*	3	476	147
ENERGY STAR	1	206	191
ENERGY STAR	2	200	168
ENERGY STAR	3	207	205
Furnace	1	111	89
Furnace	2	110	90
Furnace	3	111	78
Tankless	1	54	60
Tankless	2	54	60
Tankless	3	54	59
Tankless - New Tier	1	54	68
Tankless - New Tier	2	54	68
Tankless - New Tier	3	54	67
Programmable Thermostat	1	18	23
Programmable Thermostat	2	17	24
Programmable Thermostat	3	20	19

*The Boiler's Measure Life decreased from 45 to 30 years. Combo System's efficiency requirement increased from 90% to 95% AFUE.

Note, the adjustments reflected the unique climate zones of the Company's Washington service territory as indicated in Table 9.

Table 9: Service Territory Climate Zones

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



Emerging Technologies & Building Codes

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 interest to manufacturers 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 moving five pilot products

into the market. 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 is slated to achieve 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. Further discussion on Cascade's participation in the NEEA efforts is supported later in this plan.

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.

Cascade continues to engage with the Gas Technology Institute (GTI) Emerging Technology Program to explore new technological opportunities as they enter the market. Through these renewed efforts, the Company stays apprised of 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 toward benefiting the Pacific Northwest.

Building codes have the potential to greatly impact the Company's rebate offerings, especially those in the residential portfolio as the Company does not incentivize for upgrades and installations that are required by code. Washington State's building codes are largely national codes adopted and amended at a state level. The Washington State Energy Code (WSEC) is written at the state level but currently reflects the prevailing minimum federal standards from the Code of Federal Regulations Title 10 (CFR 10) for space and water heating as a base level. The WSEC has a points requirement for single family homes based on total square footage and offers builders seventeen options for meeting the points requirement. Although elective, installing higher efficiency natural gas space heating and water heating equipment are currently options for obtaining points as part of three of the option packages. This is an opportunity where rebates can be extremely effective in complimenting WECS's options to encourage the installation of high efficiency gas equipment for the largest uses of natural gas in residential applications.

The State Building Code Council currently advises 2015 WSEC will remain in effect until July 1, 2020 when the 2018 WSEC becomes effective. The Technical Advisory Group (TAG) process for the WSEC Residential Code amendments is starting in fall 2018. Cascade will monitor these proceedings to evaluate the impact to the Company's EEIP and incorporate upcoming changes into the modelling efforts as they become pertinent.

The code changes in the upcoming five years will likely be the most rapidly shifting and impactful the Company has encountered to date. One consideration in the intermediate term revolves around federal standards for gas furnace minimum efficiency. These standards are anticipated to adjust to 92% AFUE in CY 2021. This proposed change will *significantly* affect the Company's gas furnace offering which comprises 50% of the 2018 Residential Program therms. In its drive to promote ever higher efficiency CNGC would likely continue with an offering to encourage 98% AFUE units, but it is anticipated the residential program therm savings could be diminished by 24% following this code change. These potential impacts are built into the current LoadMAP model; however, the Company feels AEG may have underestimated the full impact of the code change to the Company's potential.

In addition to the gas furnace code change, the Washington State energy policy states a goal to "Construct increasingly energy efficient homes and buildings that help achieve the broader goal of building zero fossil-fuel greenhouse gas emission homes and buildings by the year 2031." CNGC is proceeding to continue growing the new home programs as robustly as possible with the awareness that the new home segment of the residential program may be eliminated by 2031. The impact is currently anticipated at a 22% reduction in annual applications in 2031. This impact was not included by AEG in the LoadMAP model. For the Commercial Program, the most notable change for the near term is an increase in minimum water heating efficiency for multi-family dwellings from 90% to 95% percent Thermal Efficiency proposed for the 2015 Commercial WSEC. This change, anticipated to become effective on July 1, 2020 will impact the commercial boiler rebate measure, although that impact has not yet been quantified. LoadMAP did not incorporate the impact because the WSEC change had not been proposed at the time of the CPA development. This change accounts for a 15% increase beyond federal efficiency standards. Although the impact is not as sweeping as those proposed on the residential side, it does reflect the rapidly changing code environment and the anticipated Washington State deviation from federal standards. The impacts will be further evaluated for modelling runs at the end of 2019 for CY 2020's programs.

With pressure from some constituent groups for policy driven electrification in certain communities, such as Bellingham for example, Cascade is also monitoring the development of individual city codes in its service territory that may diminish and

ultimately prohibit future installation of gas equipment and appliances. Such changes may make it increasingly difficult for long term modelling results to be truly predictive. It currently appears the drive toward electrification may proceed in some areas progressing naturally through efficiency and economically driven decision making while in other areas it may be driven by policy mandated phase out dates of fossil fuels. CNGC will continue to adapt its modelling, analysis, and measure offerings along with the new environment which will likely see more rapid and segmented variances in the data and base cases by which Cascade's potential is calculated.

Program Planning

A brief snapshot follows demonstrating the elements that go into the Company's process for narrowing down its portfolio, in collaboration with its CAG.

The Company frequently re-evaluates its program offerings in the changing context of avoided costs, building codes as mentioned previously and ENERGY STAR updates. This approach is consistent with how technology on the market gradually increases in efficiency (i.e. market transformation). Additionally, changing environmental drivers at the federal, state and local levels all have the potential to affect rebate eligibility through utility provided programs. The Company's 2018 IRP provides information on environmental externalities that may play a part in driving Company efforts in the near term toward increased efficiency requirements outside of the goals set within the LoadMAP model.

The following section provides context on some of the changes and efforts planned for the CY 2019 and CY 2020 EEIP.

Conservation Programs in 2019

The Company is 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 primary driver being to reach the goals set in place through the IRP and the Conservation Planning process.

At this time, the Company is planning the following efforts in CY 2019:

- The NEEA gas market collaborative five-year pilot will complete at the end of 2019. The Company will continue working with the collaborative on the operation plan activities proposed for cycle 6 (2020-2024) efforts. In the past year the NEEA collaborative engaged in discussions on viability of the products elected as part of the cycle 5 Business Plan and where elements of the efforts could be

redirected to take advantage of market signals and successes. The Company continues to review NEEA efforts with a key element of the internal discussions weighing on what type of savings have been achieved and what can, or should, be claimed after the initial five years of funding have been expended. Additionally, the Company will work with its CAG on how cost allocations associated with the NEEA efforts will be allocated after the initial pilot elapses.

- The Nexant iDSM Central rebate processing software currently in use for the residential, low income and trade ally programs will be reviewed before the end of 2019. The Company has devoted a substantial amount of time and effort to utilize the processing 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 for customer application entry and TA management would be viable. An added 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 Company will review its Commercial Program implementation processes and evaluate whether an altered delivery model would be prudent to increasing success, savings achievements and growth of the program. At completion of the 2018 CY the Company will review the savings achievements of the C/I program as part of this evaluation. 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 Company will also keep abreast of discussions and results of Docket U-161024 – Competitive Resource Acquisition by Request for Proposal as it pertains to natural gas conservation Requests for Proposal and the competitive procurement framework for EE delivery.

- The program's internal tracking Evaluation, Measurement and Verification tool within iDSM Central is currently not operational but should be available within the first half of the year and be gathering data as of 2019 to 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 on funding availability and program cost-effectiveness.

- As noted in the two-year action plan Cascade will continue to perform annual technical reviews of the measures identified within the CPA for inclusion in the portfolio of available measures along with identifying new technologies as they come to market. The Company will also review and revise ramp rates within the LoadMAP model.

- One additional area of interest and potential sector the Company has not fully developed involves working with internal business development staff at an Operations level. The Energy Efficiency department can leverage more customer outreach efforts to promote high-efficiency options at a stage in the decision-making process when it is far easier to move the customer toward efficiency. Program staff worked collaboratively in 2018 to develop a notification system between the districts, energy-efficiency and the third-party implementation vendor for the EE programs. The next year allows further refinement and improvement on these efforts alongside increased account management strategies. The EEIP supports an aggressive business development approach through its C/I program and has increased direct contact with customers in the past year to drive uptake. This effort will pair with those currently in the development stage for the district operations group.

Additional areas the Company is considering updating in 2019 include:

- Revision of the Attic R Value requirements – i.e. clarifying between Attic insulation for sloped versus flat surfaces, and better indicating the difference between attic and ceiling insulation in program materials
- Modification of the Energy Savers Kit offerings possibly including additional items in the kits to support low cost savings including shower timers, improving the quality of the shower heads and aerators and/or adding additional selection options for consumers
- Inclusion of a smart and/or Wi-Fi enabled thermostat offering
- Prescriptive duct sealing and air sealing rebate opportunities (outside of the ones already being added per LoadMAP)
- Clarification of glazing allowance for residential door rebates
- Increasing collaboration with Clean Air Agencies to promote transitioning wood-burning customers to high-efficiency natural gas furnaces and fireplaces. Additionally, the Company will continue participation in the RVT discussions and will explore viability of including NEI's associated with transitions of this nature in its cost effectiveness calculations.

Inspections

Residential program inspections are completed by one internal staff member in Climate Zone 1 and 2, and a third-party contractor in Climate Zone 3. Residential inspections provide verification of measures and equipment installed, and they are a positive public-facing component of the program. Any failures found during inspection are remediated immediately and re-inspected.

As the number of approved projects increases, the quantity of completed inspections should follow. The Company historically completed inspections on up to 5% of completed projects. There may be a need to certify additional internal staff to complete Residential inspections to meet the increase in rebate submissions.

The Company also plans to revise the Residential weatherization manual. The manual will be distributed to all CNG Trade Allies completing weatherization, with the intention of providing consistency across all service areas. The manual will also confirm uniformity between internal staff inspections and those performed by a third-party contractor.

Commercial/Industrial Program Updates

Two areas of change in the 2019 C/I Program include the restructuring of unit heater and tankless water heater measures (as referenced in the Summary of Commercial Changes section of this plan) towards higher efficiency levels, and greater uptake through increased incentives. The Company has chosen to focus on these two measures because the current offerings have fallen out of alignment with available equipment and current purchasing trends.

Unit heaters are broadly installed in all types of warehouses, industrial workshops, automotive service facilities, small manufacturing facilities and assembly areas, etc. C/I Program uptake for high efficiency models under the existing program has remained low due to the prevalence of standard efficiency unit installs within Washington. The current rebate will be shifted from two separate tiers with thresholds at 86% and 92% AFUE efficiency to a significantly higher rebate at a minimum 92% AFUE. This proposed increase is supported by the 86% unit only accounting for a 4% above code rating. Additionally, the two principal manufacturers in the market have product lines which exclude the first-tier option all together by jumping from 83% to 93% efficiency levels. The proposed final measure's efficiency of 92% demonstrates the condensing technology threshold which is currently the best available market technology for standard unit heaters.

The overall national unit heater market has achieved little transformation. To drive higher uptake of this broadly applicable measure, CNGC will be testing a pilot to work with the

two largest manufacturers of this product to determine how to promote increased product interest at the midstream supply house level. The Company has had some success in promoting this model through the 2018 Residential Program's combination boiler measure. NTI boilers and local wholesale supplier, Keller Supply, both contacted CNGC separately to discuss the rebate and qualifying models upon learning of the higher rebate offered through Cascade. Agreement was made to cobrand with the NTI Boilers on promotional flyers to their supply houses. Separately, Keller Supply's outside sales representative in the Whatcom and Skagit County area directly promoted the rebate with their qualifying products from Navien and NTI. The Company has seen a slowly growing response from Trade Allies resulting directly from these efforts. The unit heaters will be more challenging, but it is a key space heating element in the C/I program where efforts will continue to drive higher efficiency equipment installations.

Tankless water heaters are beginning to come of age in the market as the technology and equipment costs are improving. Install costs remain high, due in part to the current contractor labor shortage and high workload. The C/I program currently incentivizes tankless water heaters at 82% Energy Factor (EF) and above. For 2019, the Company is proposing increasing this to a minimum of 0.87 UEF, equivalent to 0.91 EF, which is the threshold for condensing technology. The rebate will increase by 150% which remains well under 50% of incremental installed cost for typical applications.

The unit cost differential between 0.87 UEF and 0.97 UEF tankless water heaters is diminishing. The CNGC programs are always working toward driving uptake with the highest efficiency equipment that makes economic sense for the Company's customers. To achieve this objective with the C/I tankless measure, the Company is introducing the second tier to drive uptake of 0.93 UEF models as mentioned previously. The intention is to promote installation, not just to the more efficient tankless unit, but to models performing within the highest 4% efficiency range capable with currently available products.

As the Company pursues greater participation in the Commercial sector for insulation projects in existing buildings, third-party inspection outside of that performed by Lockheed Martin of those projects may be deemed appropriate. The need for third-party inspection of Commercial sector projects is dependent on the amount of uptake due to increased rebate amounts for insulation in 2019 and availability by program implementation staff.

Program staff will also be analyzing C/I participation levels attributable to each of the prescriptive and custom tracks. Historically, the C/I program savings achievements weighed heavier toward custom projects, over 60%, which inherently provides an

element of uncertainty as to which major projects may arise within the sector. This ebb and flow from large custom installations has attributed to the major variations in program achievement from one year to the next. The C/I vendor altered its approach in CY 2018 to concentrate on more of the prescriptive offerings, which will result in 2018's ratio mix showing closer to 66% prescriptive measure installs, again allowing more certainty and accurate forecasting of savings in the queue. Additionally, the vendor has already identified a significant number of custom projects for completion in CY 2019 and believes the percentages may balance each other moving forward. As of the time of this writing, the C/I vendor has surpassed the savings attributable from both 2016 and 2017 as well as the number of participants and is in line to meet its goal for 2018.

Conservation Programs in 2020

The 2020 program year will represent an additional opportunity for the Company to strive toward its ever-increasing efficiency goals. Efforts put in place in 2019 will continue, including the constant scanning of viable measures to incorporate into the portfolio, increasing outreach and messaging to customers to reach new audiences and continuing to build and nurture the Trade Ally Network.

This will also be an opportunity to further align with the business development efforts put in place in CY 2019 from within the Corporation. Additionally, there may be opportunities to look for synergies within the energy efficiency departments within the Montana Dakota Utility (MDU) group and potentially move toward an internally implemented software platform.

Additionally, Cascade has been approached to gauge the Company's interest in working with the NWPCC and its Regional Technical Forum (RTF) to develop standards to verify and evaluate energy efficiency savings for natural gas measures. Currently the RTF is supported by electric and dual fuel funders and is exploring what efforts could be put in place to provide similar resources for natural gas providers beginning in 2020's cycle. The Company was tasked with researching available regional resources in 2017 when it developed its RFP and as part of that research concluded there is a lack of consistent and reliable energy saving estimates regionally accepted and quantified. The Company is eager to discuss the possibilities in 2019 and ascertain viability within the 2020 program cycle.

CY 2019 may be the first year the Company will be able to attribute savings to the EEIP from the NEEA collaboration although exact estimates are not available. It's more likely savings for Next Step homes will occur in later 2019, early 2020.

Planning and EM&V

The Company and its software vendor Nexant Inc. are finalizing the specifications for the residential eM&V program as part of the iEnergy suite provided through Nexant Inc. with implementation scheduled for December 2018. When it became evident there were gaps in Nexant's ability to configure a solution, the Company developed the methodology and algorithms to cost-effectively conduct evaluation, Measurement and Verification within the third-party program reporting software platform. Nexant has stated they are now marketing the eM&V program to regional utilities including Avista, Tacoma Power and PSE. Beginning in 2019 the program will enable Cascade to conduct internal, transparent eM&V of its EEIP, during the two or three-year interim between third party EM&V studies, for a predefined sample of Washington Cascade customers who have participated in the EEIP and have one year of pre- and post-installation energy usage history. The Company will not be performing C/I EM&V through the iEnergy platform but will continue to work with its C/I vendor to evaluate projects and work toward incorporating an EM&V survey and/or activities in the following year.

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 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.

The WIP is supplemented by the Enhanced Low-Income Weatherization Incentive Program (EWIP) which took effect on February 1, 2017. The WIP provides funds to agencies based on the avoided cost of tariff-eligible weatherization measures installed in a customer's home. Under EWIP, 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. A memorandum of understanding with a committed number of annual projects is required for each Agency interested in participating in EWIP.

On August 1, 2018, revisions to the WIP/EWIP program took effect. These changes resulted from the outcomes of the Company's rate case settlement agreement. As a result, the $10,000 cap per project that had previously been in place under the first

iteration of EWIP was removed. A project coordination payment equating to "a maximum program average of 15% of the total project cost as billed to the Company" was added along with an additional agency indirect-rate in the amount of 10% of the total project cost as billed to the Company. Avoided costs were also updated to reflect the Company's most recently acknowledged IRP.

The measures in Table 10 qualify for a rebate through the current WIP/EWIP tariff.

Table 10: Current Low-Income Weatherization Rebate Offerings from Tariff 301

Measure	Avoided Cost per Therm
Ceiling Insulation	$30.98
Wall Insulation	$30.98
Floor Insulation	$30.98
Duct Insulation	$30.98
Duct Sealing	$7.04
Infiltration Reduction	$7.04
Water Heater Insulation	$10.24
Low-flow Faucet Aerator	$5.30
Low-flow Showerhead	$5.30
Natural Gas Furnaces (95% AFUE or greater) *	$10.24
Furnace Tune-Up and Filter Replacement	$5.30
Direct Vent Natural Gas Space Heater (90% AFUE or greater)	$11.59
Natural Gas Water Heater (0.91 EF or greater tankless)	$10.24
Natural Gas Water Heater (0.64 EF or greater storage)	$6.45

* Unless Department of Commerce specifications explicitly 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 Ratio (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. The Company has also had preliminary discussions with its Advisory Group regarding the use of other auditing methodologies as approved by Commerce.

In addition, Cascade has been actively engaged with its Advisory Group, the Department of Commerce, the Energy Project, and the agencies delivering the WIP/EWIP program to address remaining barriers to program participation.

Participation for each program year can be found in Table 11. The Company included the avoided costs used for 30-year measures in each program year, the total funds paid out to the Agencies per year; and the average rebate per home. As the table indicates, participation peaked between 2010 and 2012 because of the agencies' ability to access funding through the American Recovery and Reinvestment Act (ARRA). These monies allowed weatherization agencies to stretch their DOE and utility funds to serve more income-qualified homes. After ARRA funding was no longer available, participation in Cascade's WIP declined below pre-ARRA levels. Multiple factors have contributed to this decrease, including changes in the interpretation of customer prioritization guidelines, fluctuations in avoided cost and agency preference in the use of available funding sources. Over the last few years, Cascade has made substantial adjustments to its Weatherization Incentive Program tariff (as reflected in the EWIP, and subsequent August 1, 2018 adjustment) to provide greater funding for the weatherization of income-qualified Cascade households. A description of the current program year, and engagement with Cascade's partner agencies can be found in Table 11.

Table 11: Weatherization Incentive Program Participation Levels & Savings by Year

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
2017	27	5,564	$165,935.00	$6,145.74	$8.09

Preliminary findings for the 2018 Program year are as follows:

Approximately **25** projects were submitted as of November 2018, representing **4,511** therms saved and **$196,255** paid out to agencies with combined WIP and EWIP monies. An average of **$7,850.20** was provided as rebates per project this program year. The increase in per-project spending reflects the addition of a project coordination fee and indirect rate resulting from the Company's most recent rate case. These changes were designed to provide funding levels sufficient for agencies to deliver weatherization

services to natural gas homes with greater proportionate utility support. It is the Company's hope agencies will be able to focus on deeper energy savings in customers' homes as a result of these changes.

Four projects eligible for expanded funding have been submitted for rebate since the changes to the WIP/EWIP tariff have taken place. The Company met with the agencies delivering the WIP/EWIP program on October 15, 2018, in order to encourage greater program participation and ensure all qualified agencies are aware of the expanded funding available to them.

The Company is actively working with its agency partners to adjust the rebate submission process to balance the stakeholder desire for streamlined documentation with the need for adequate program oversight.

Traditionally, the Company has required agencies to submit a rebate application form; the TREAT or Priority List document demonstrating cost-effectiveness for all measures for which the agency is requesting a rebate; invoices documenting the claimed costs for all measures for which the agency is requesting a rebate; and the final inspection report.

The Energy Project had expressed concerns regarding the requirement for the above-listed documentation. Specifically, The Energy Project had noted that such paperwork is already provided to the Department of Commerce to qualify for State weatherization funds. The organization therefore suggests that Cascade coordinate with Commerce to review program documentation validating cost-effectiveness and program costs on an annual basis, rather than request this documentation directly from the Agencies for each submitted rebate application.

In late summer 2018, Cascade met by phone with the Department of Commerce, Energy Project, and WUTC Staff to gain a better understanding of the documentation currently collected by Commerce, and whether Cascade would be able to access this information electronically. The Company learned its documentation requirements are similar to, but less detailed than Commerce's requirements, and that at this time access to the electronic database would not be possible. The Company however is sensitive to the concerns of The Energy Project and the agencies it represents and has agreed to remove the requirement for final audit and inspection documentation.

The Company also met with its CAG in early October 2018 to propose the removal of the final audit and inspection form from its documentation requirements, and to seek confirmation regarding the continued requirement for the rebate form, relevant energy

audit or priority list findings, and relevant invoices. At this time, it appears the CAG is supportive of the removal of the final inspection form requirement, and the maintenance of the documentation requirements related to the rebate application, energy audit, and invoices. After meeting with its agency partners, the Company has agreed to remove the requirement for the final inspection report as part of its mandatory documentation.

The Company has additionally requested guidance regarding instances where final measure costs are significantly higher than those represented in the initial TREAT audit. While this does not happen frequently, there have been several instances where such variance has been significant. In such cases, the Company has required the agencies to provide additional documentation or rerun their audit to narrow the gap between the estimate and actual expenses. However, this requirement, while infrequent, has been of concern to the agencies to which this request has been made. The Company therefore approached its CAG to see if simply requiring a written statement from the Agencies explaining any sizable variances in costs between the TREAT and final invoices would be acceptable to Staff and other stakeholders. During the discussion, Staff indicated it would be acceptable for agencies to simply provide a written statement when there was a significant variance between the costs and TREAT and the invoices provided, as opposed to requesting significant additional validation of measure cost-effectiveness.

The CAG also discussed what “significant variance” means and determined that could either be a monetary amount (i.e.: more than $1,000) or a delta beyond a certain percentage. The Company convened with its Agencies during the October meeting and discussed the process for documenting such variances. Final consensus resulted in a 20% variance per measure in TREAT triggering a change order and/or explanation of variance to accompany the project submission. Additional discussions centered on required documentation and the association of Health and Safety expenses with a specific measure during submission. During Cascade’s October meeting with the agencies, Cascade and its weatherization partners agreed changes to costs between TREAT and final invoices exceeding a 20% difference will require written documentation. The Company agreed a copy of the agencies’ Change Order documenting work revisions following the initial audit would be acceptable.

Meanwhile, Cascade has heard from several of its Agencies that the State’s recent interpretation of prevailing wage requirements has resulted in dramatic increases to the cost of labor for weatherization work. (For example, As of September 1, 2018 the hourly rate for a residential insulation applicator in Walla Walla County increased from $11.50 to $45.11). An increase in the cost of labor of this magnitude makes it difficult for

agencies delivering Washington's weatherization program to meet cost effective requirements. Cascade is working closely with its CAG and Agencies to better understand this issue and to determine what, if any, support can be given to help face this challenge. It is the Company's understanding that the Energy Project is currently working with Commerce and the Agencies on potential solutions. As of November 2018, the Department of Commerce has issued a deemed measures list to agencies allowing a waiver to traditional cost-effectiveness under Commerce-approved modeling tools. This waiver covers the period of November 1, 2018 through June 30, 2019 to provide a transition period for agencies to adjust to prevailing wage related cost increases. Cascade is working with its CAG to determine whether it should mirror this temporary accommodation, or seek alternate solutions

The Company is appreciative of its low-income agency partners and is committed to continuing to work with the Agencies and Energy Project to develop a stronger partnership, help increase program participation, and identify externalities beyond the control of Cascade, and/or the agencies themselves that impact program uptake.

Targets Developed through LoadMAP

Cascade is providing targets for its conservation potential based on the same inputs as used for the 2018 IRP, including updates to the measure libraries and administrative costs.

These projected achievements are based on the Company's current best estimates of its Achievable Economic potential. Performance deviations from projections are subject to evolving efficiency technologies, customer interest and resulting program participation levels as well as external influences from regional and regulatory bodies.

In the following subsections, the Company will elaborate on its modeling processes, modeling tool and provide an analysis of the future potential as well as opportunities for increased participation while briefly addressing some of the steps proposed to aim for the Achievable Economic goals.

CY 2019 & 2020 Targets

The Company has included the most up to date Achievable goals as per the LoadMAP model for 2019 and 2020. These goals have been developed with the recent updates the Cascade program implemented in mind.

As part of the two-year action plan, the Company will continue to explore the cost-

effectiveness of measures included in the full AEG review and not currently offered or proposed in its portfolio based on availability to the marketplace, administrative costs to implement and other elements including fluctuations in Avoided Costs. 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 aim for a level of savings that could be achieved should the full breadth of offerings be included in the program portfolio throughout the plan horizon. Adjustments to the portfolio will continue throughout the near horizon, specifically in 2020 as a reflection of the 2020 IRP input updates and to position the Company to adapt to accommodate building code changes and technological developments.

Calendar Years 2017 and 2018 have demonstrated a significant step increase in residential program therm savings for the EEIP as the Company set the stage to increase program accomplishments commensurate with the potential indicated by the Nexant TEA-Pot model (the tool used for savings potential calculations in the 2016 IRP). To meet ever-increasing goals, the Company recognizes continuous improvement and ingenuity are necessary to reach its goals and notes the programs are constantly evolving to meet these needs from Commission directives, market changes, technological improvements and policy changes amid a vast array of externalities.

As mentioned previously, the conservation potential for this Plan is calculated through the AEG LoadMAP model, separated into the three customer classes for individual savings assumptions, market segmentations, and end uses (heat-sensitive resources have different savings potential by climate zone for the Residential section). Further elaboration on this process follows.

LoadMAP generated targets will be acknowledged in the conservation plan and the Company will aggressively strive towards meeting them as committed. Regardless, the programs will be built in a way that ensures cost-effectiveness can be maintained even if participation levels fall shorter, or admin costs run higher than calculated.

The Conservation Program targets for CY 2019 are lower than those set for the C/I program and lower than thoseachieved for 2018's Residential program, due to a variety of factors. Primarily on the Residential side, the deemed therm savings per measure after the AEG CPA adjustments translate to a need for more projects to meet the same level of therm savings goals as before. In addition, the last Conservation Plan included all cost-effective measures split between the 30% and 50% of incremental cost categories to better reflect their inherent adoption curves (per the previous TEA-Pot

model's design) and to reach a more accurate reflection of the short-term conservation potential under past program offerings. More incentives remained below the 50% of incremental cost threshold than previously modeled for, and while cost-effective at that point the adoption curves (or ramp rates) were also lower. Furthermore, for the C/I program, the continued higher level of administrative costs, while an attempt to better assure and raise therm savings through increased outreach and altered contracting model does impact cost-effectiveness, and ultimately potential.

Figure 1 shows the biennium historical performance and short-term forecast while Figure 2 demonstrates the recent annual program performance and short term annual forecast.

Figure 1: Incremental Portfolio Biennium Goals

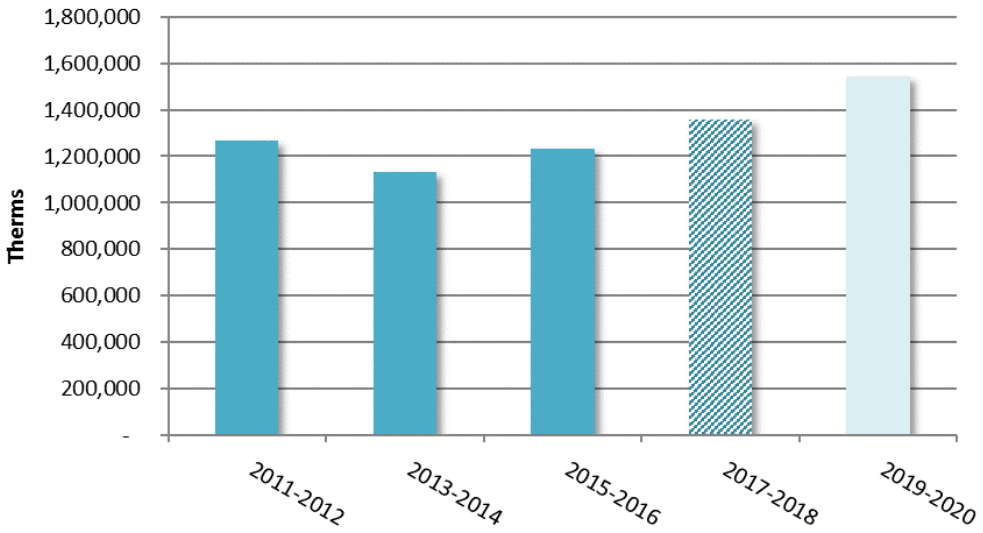
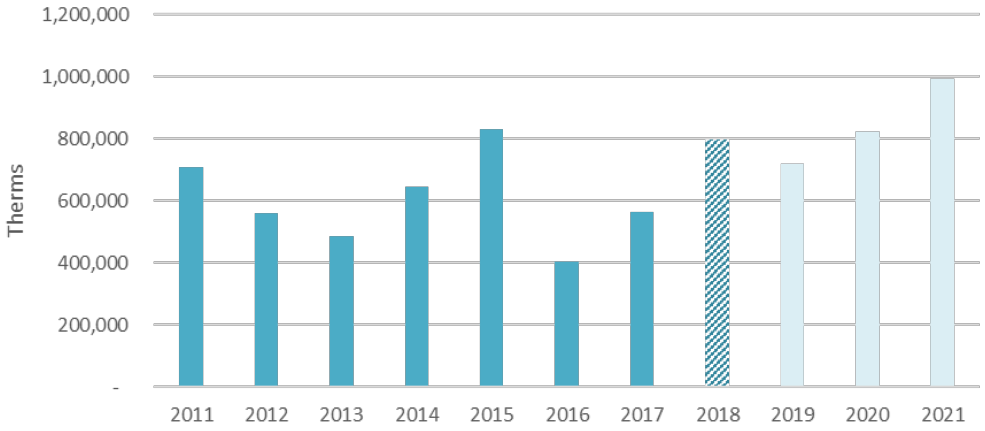


Figure 2: Incremental Portfolio Annual Goals



For this forecast, the AEG CPA estimated energy efficiency savings developed into three types of potential: Technical potential, Achievable Technical and Achievable Economic potential. Appropriate, gas specific market penetration rates were developed based on the NWPCC's ramp rates. AEG analyzed this potential via a customized tool developed from a Microsoft Excel-based modeling tool, LoadMAP for the Cascade CPA.

> *"Load Management Analysis and Planning (LoadMAP™) tool was developed in 2007 and was first used for the EPRI National Potential Study. Since that time, LoadMAP has been used to develop end-use forecasts and perform dozens of energy efficiency (EE) potential studies. The LoadMAP model provides forecasts of energy use by sector, segment, end use and technology for existing and new buildings. It can also be used to isolate and estimate savings from DSM measures and programs. LoadMAP was developed by Global Energy Partners, LLC (GEP) under the direction of Ingrid Rohmund. EnerNOC acquired GEP and the LoadMAP model in 2011. In June 2014, AEG acquired EnerNOC's Utility Solutions Consulting Group and the LoadMAP model. AEG supports ongoing enhancements to the model[8]."*

This modeling tool was built on a platform that provides the ability to run multiple scenarios and re-calculate potential savings based on variable inputs, such as the customer and demand forecasts, IRP long term discount rate, transmission loss rate and avoided costs as well as recent annual program performance and measure data

[8] CPA, Appendix H, Page I, in Appendix D of the CNGC IRP

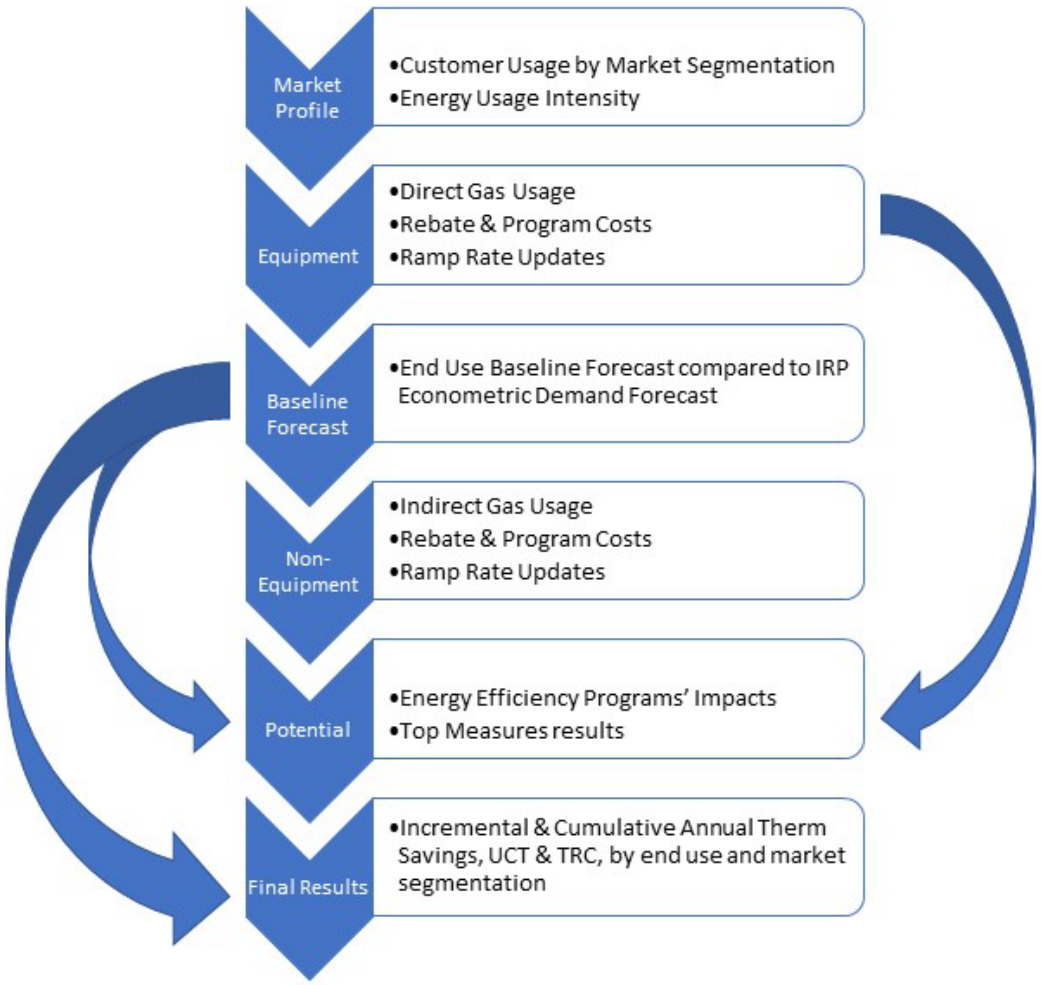
collected through energy efficiency applications to establish incremental costs reflective of service territory. This model provides transparent assumptions and calculations for estimating market potential.

While Technical and Achievable Technical potential are both theoretical limits to efficiency savings, Achievable Economic potential embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase. Cascade's energy efficiency program adopted the Achievable Economic potential to set goals under an array of possible future conditions.

The following subsection elaborates on the methods used by the LoadMAP model to develop the three levels of potential for the programs and subsequent creation of the Company's two-year short-term plan. Cascade prioritizes the UCT. The benefits of the UCT were discussed previously under the Cost-Effectiveness and Docket UG-121207 sections. Industry standard cost-effectiveness tests were performed to gauge the economic merits of the portfolio. Each test compared the benefits of the energy efficiency metric to their costs defined in terms of net present value of future cash flows.

LoadMAP provides the Company with a much more nuanced and manageable method to developing its portfolio than was used in the past. Figure 3 represents the new savings potential process LoadMAP uses. There are six separate workbooks that make up the full DSM forecast for each customer class. They all follow the same order of operation, starting with the Market Profile, which feeds into the Equipment workbook. The Equipment then feeds into the Baseline which feeds into Non-Equipment. When running the Potential model, the Equipment, Baseline, and Non-Equipment are all imported. The Final results import the Potential results and the Baseline.

Figure 3: New Savings Potential Process in LoadMAP



One process change to note is the difference between LoadMAP's and TEA-Pot's incorporation of administrative costs. TEA-Pot needed admin entered as dollars per therm by end use amount. LoadMAP requires entry as a percent of the incremental costs in the Equipment and Non-Equipment models. This allows for input of administrative costs at a more granular level, by each measure, rather than by grouping of measures by end-use.

The CPA also provided guidelines and best practices on how to update ramp rates based from the NWPCC methodology and industry best practices. Ramp rates were updated for a portion of the measures in the Residential Program based on significant changes since the CPA's 2016 base year. Residential Program performance has increased substantially in the past eighteen months, allowing for select measures to move forward more quickly

along the NWPCC's ramp rates than initially anticipated by AEG. These include furnaces and insulation measures.

Market Segmentation & End Use

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.

Residential market segmentation is split by Climate Zone (same as in the Company's previous modeling software) and into Single family and Multi Family, resulting in six market segments.

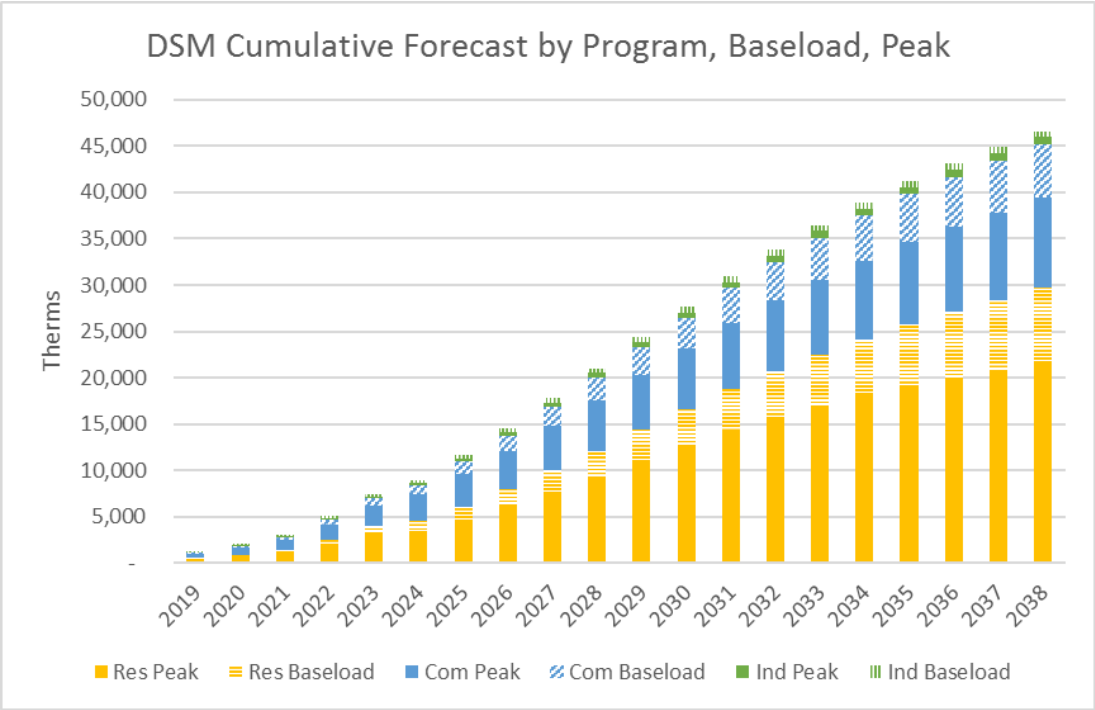
Commercial market segmentation is split into nine segments: Office, Retail, Restaurant, Grocery, Education, Healthcare, Lodging, Warehouse, and a "Miscellaneous" category.

Industrial market segmentation is also split into nine segments: Food Processing, Agriculture, Primary Metals, Stone/ Clay/ Glass, Petroleum, Paper & Printing, Instruments, Wood & Lumber Products, and an "Other" category.

End uses are split into Heating, Water Heating, Secondary Heating, Food Preparation, Appliances, Process Heating, and miscellaneous. All of these are ultimately categorized into baseline and peak load shaving. This is the first time the DSM forecast has provided a cumulative forecast by baseline or peak load, which in turn also allowed the DSM forecast to be run under two sets of avoided costs – one for the annualized average and one for the peak load average avoided costs.

The DSM forecast is split into the new baseline and peak load end uses in Figure 4.

Figure 4: Savings Potential, Baseline-Peak in Therms



Note, LoadMAP allows for more sets of avoided costs to be run concurrently than previously supported and has a placeholder for the Resource Value Test, which is currently set to add a straight 15% to the avoided costs per AEG's design. In the future LoadMAP has the ability to accept more nuanced benefits to reflect regionally approved factors.

Some of the measures deemed cost effective by AEG and able to contribute potential to the programs in the first runs would be new additions to the program offerings for the Company. Due to their untried nature in the territory, further research is needed to determine their realistic ability to contribute therm savings to the Company's rebate programs. For example, the Solar Hot Water heater was shown cost effective with a rebate set close to $300. However, upon further investigation into the technology's prices and availability in the Company's service territory, it was determined current installation costs approached $20,000 and few, if any, TAs offered the equipment to customers, not to mention inconsistent manufacturer support and documentation. With these issues identified, the Company updated the measure's ramp rate by shifting it three years into the future. This allows for product maturity while awaiting market transformation efforts similar to those performed by NEEA to adequately launch these newer technologies.

Alternative scenarios using three sets of potential costs of carbon, discussed in the 2018

IRP within Section 5, were developed into new avoided costs and LoadMAP was re-run with these scenarios in mind. The impacts of Ballot 1631 (-3.3% cumulatively over the full forecast time horizon), Governor Jay Inslee's proposal (-4%), or Market Choice (-2%) options were minimal to the energy efficiency program. Details of the results can be found in Appendix D of the 2018 IRP.

Target Development

LoadMAP generated targets will be acknowledged in this Plan and Cascade will aggressively strive toward them throughout the year. Nonetheless, the programs will be built in a way to ensure cost effectiveness can be maintained independent of the target completion.

Below is a brief list of what has been altered in this iteration of the conservation forecast from previous IRP submissions:

- Divided Demand Side Management forecast into Climate Zones for Residential;
- Updated all model inputs, which are discussed in depth, under the Assumptions and Inputs section
- Updated Residential Program ramp rates commensurate with recent program performance increases

Assumptions and Inputs

The unique inputs used for climate zone market segmentations in the Residential forecast were customer count and demand forecasts and the avoided costs. All other factors were held constant across each Climate Zone's scenario, such as the inflation rate, long-term discount rate, load profile, transmission loss rate, cost-effectiveness threshold, and ramp rates.

When running the model both the Residential and the Commercial/Industrial programs used all technologically available measures for the full forecast. 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.

Below is a summary of the other model inputs, which remain consistent with the 2018 IRP:

- Inflation rate increased to 2.00% from 1.00%
- Transmission Loss rate decreased from 0.1959% to 0.1615%

- Long-term discount rate increased from 4.17% to 4.43%, tied to the average 30-year mortgage rate. The lower the long-term discount rate, the higher the therm savings potential because future years' therm savings' avoided cost values are discounted less, and thus more of the avoided costs can be included, thereby allowing the benefit-cost ratios for measures to pass the 0.90 cost-effectiveness threshold.

- Avoided costs were updated per the IRP's Appendix H, Avoided Cost Calculations, and divided by climate zone for the residential portion as well as into baseline and end use for peak shaving measures. In addition, alternative carbon pricing scenarios were provided and run through the model to determine their impact on DSM. The higher the avoided costs, the higher the therm savings potential because avoided costs under the UCT increase the benefit-cost ratio to allow more measures to be considered cost effective. Conversely, the lower the avoided costs, the lower the therm savings potential forecasted.

- Administrative Costs increased to meet the Residential program's higher processing needs to reach higher performance levels and future targets. It also allowed expansion of Commercial and Industrial EEIP outreach. Budget figures and discussion are provided in the Program Goals & Budgets section. 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 increasing processing and expanding outreach efforts, and thereby program performance.

- Load Profile, Customers and Volume Forecasts, by Climate Zone, were not updated and remained consistent with 2016 per the AEG CPA and LoadMAP deliverable.

Scenarios & Forecasts

The following provides Cascade's achievable forecast by climate zone for Residential and end use, as well as customer class as per the LoadMAP model from 2019 through 2028, for the 10-year time horizon.

Residential Scenarios

As mentioned previously, the model was run individually by climate zone for the Residential customer class to provide increased granularity. Figure 5 provides the Residential cumulative potential and outcomes by climate zone are reflected in Figure 6.

Figure 5: Cumulative Potential Forecasts for Residential

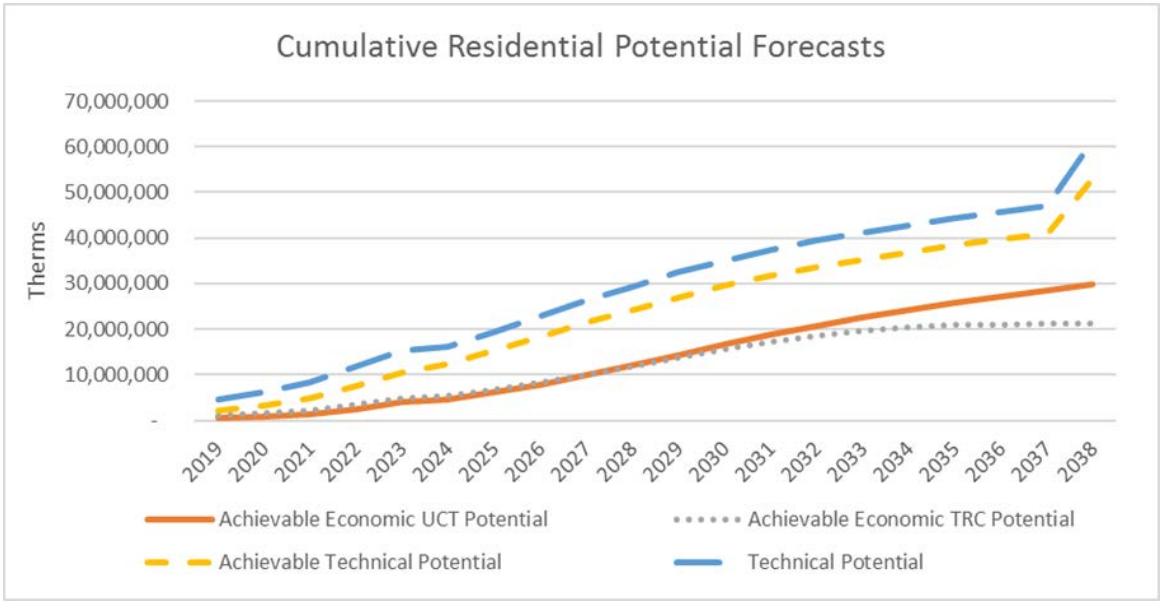
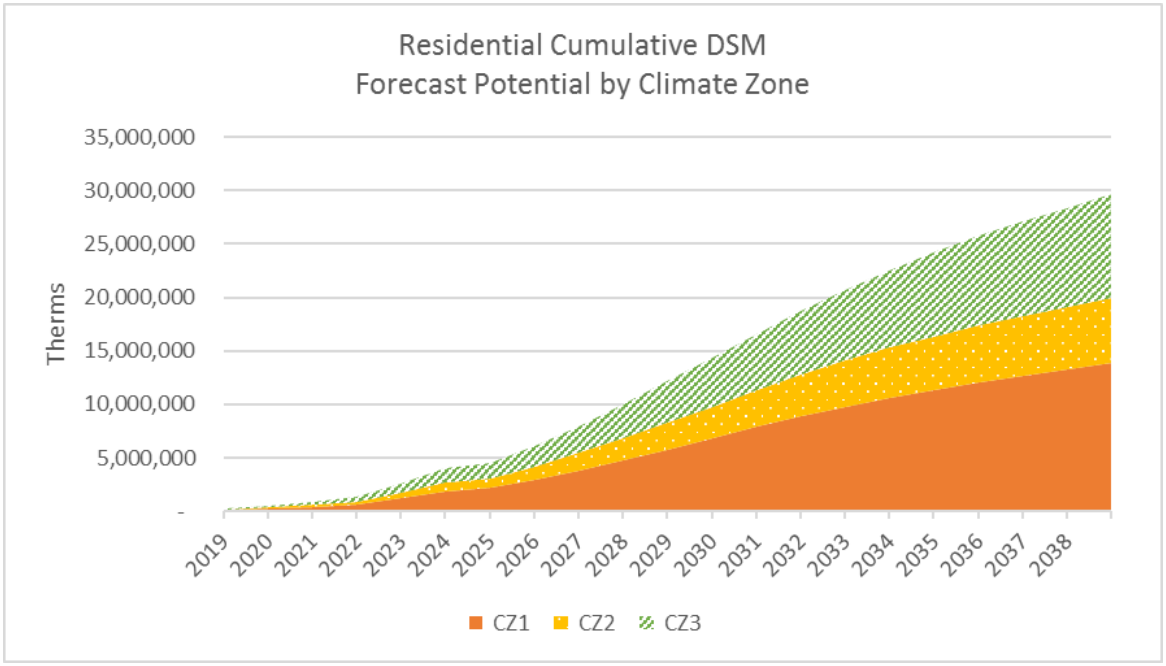


Figure 6 shows the Residential portion of the DSM forecast, split by climate zone.

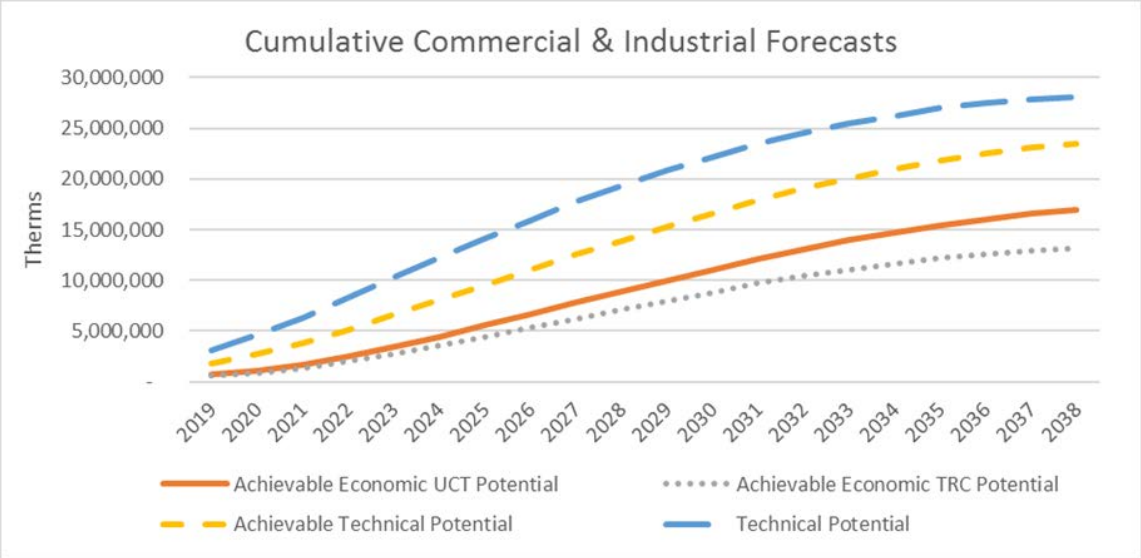
Figure 6: Residential Achievable Economic UCT Potential by Climate Zone in Therms



Commercial/Industrial Scenarios

Figure 7 shows the cumulative DSM forecast for the Commercial & Industrial sector by Technical, Achievable Technical and both UCT/TRC Achievable Economic Potentials.

Figure 7: Cumulative Potential Forecasts for C/I



It is important to note the screen conducted with the LoadMAP tool and internal valuation mechanisms 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 historically 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. CY 2018 has experienced a change in prescriptive to custom proportions however and is currently tracking above66% prescriptive.

Combined Residential and C/I Portfolio Potential

Figure 8 shows the cumulative DSM forecast by Technical, Achievable Technical and both UCT/TRC Achievable Economic Potentials.

Figure 8: Cumulative Potential by Forecast

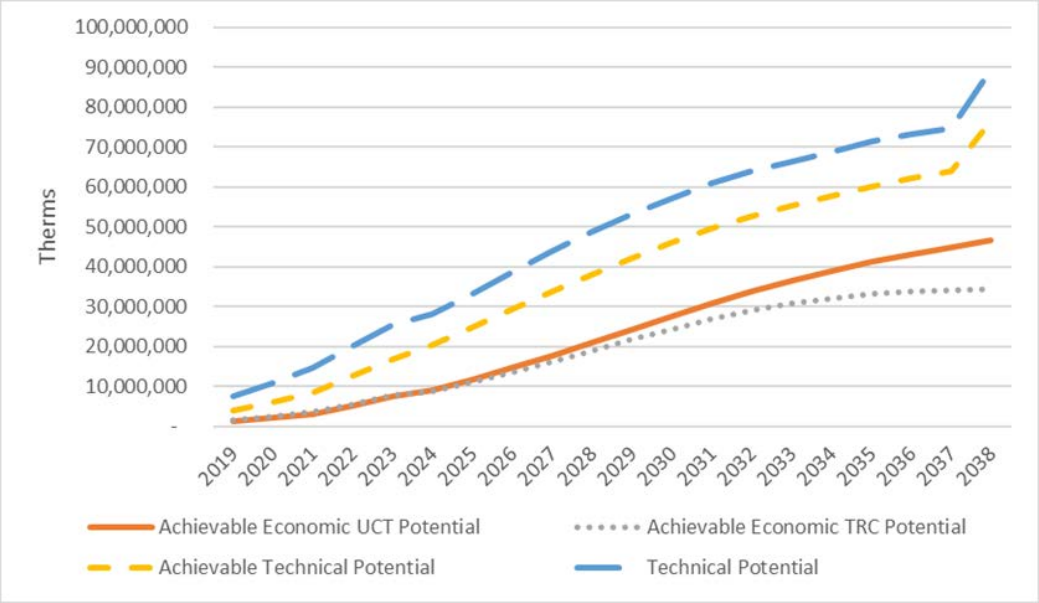
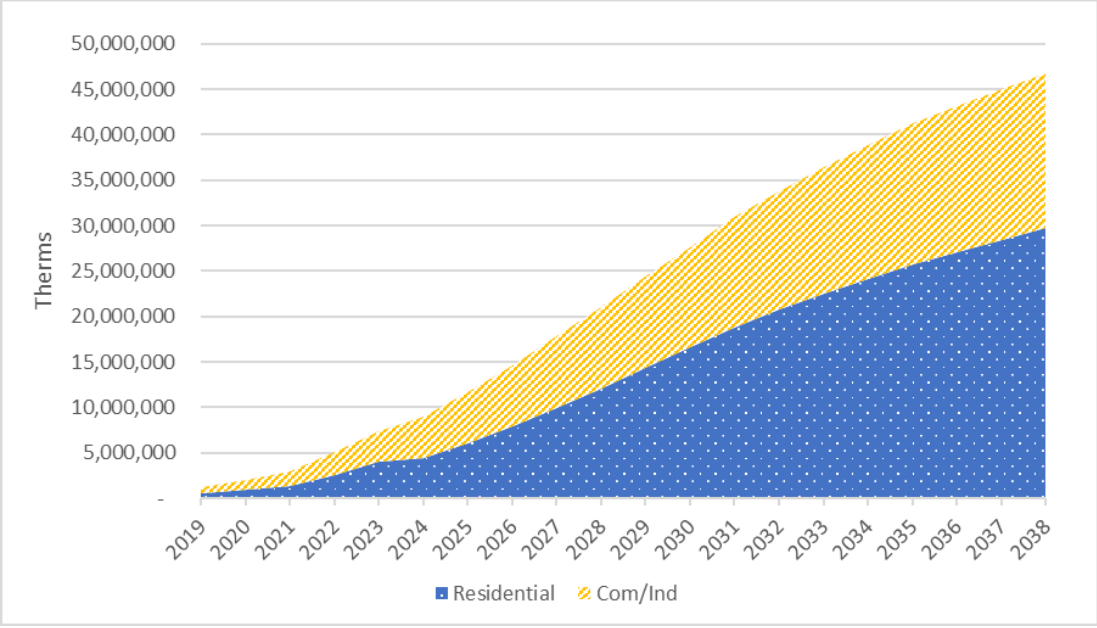


Figure 9 provides cumulative Residential and Commercial/Industrial UCT Achievable Economic Potential.

Figure 9: Cumulative Achievable Economic UCT Potential by Program



Forecasts

A summary of the results of the forecasts are in Table 10, demonstrating the UCT and TRC incremental and cumulative forecasts for Residential, Combined C/I and portfolio total.

Table 11: 20-Year Technical Achievable Forecast Incremental, Cumulative, UCT/TRC

YEAR	Total Technical Achievable Forecast Comparison											
	UCT				TRC							
	Incremental		Cumulative		Incremental		Cumulative		Total UCT Incremental	Total TRC Incremental	Total UCT Cumulative	Total TRC Cumulative
	Residential	Commercial/ Industrial	Residential	Commercial / Industrial	Residential	Commercial/ Industrial	Residential	Commercial/ Industrial				
2019	333,424	370,587	529,565	701,507	527,930	293,012	990,215	570,871	704,011	820,941	1,231,071	1,561,086
2020	369,466	437,271	900,529	1,137,156	559,955	337,526	1,551,164	906,591	806,737	897,481	2,037,686	2,457,755
2021	465,165	513,429	1,358,618	1,652,579	632,796	396,405	2,170,058	1,304,929	978,595	1,029,202	3,011,197	3,474,987
2022	1,167,261	874,586	2,514,790	2,526,220	1,352,349	716,252	3,501,276	2,019,777	2,041,847	2,068,601	5,041,010	5,521,053
2023	1,470,421	937,533	3,971,553	3,470,221	1,388,303	759,659	4,867,741	2,783,484	2,407,954	2,147,962	7,441,774	7,651,226
2024	1,400,354	1,009,699	4,494,103	4,464,761	1,253,099	800,814	5,258,346	3,570,390	2,410,053	2,053,913	8,958,864	8,828,736
2025	1,655,317	1,075,933	6,085,454	5,533,750	1,490,184	854,519	6,674,851	4,421,711	2,731,250	2,344,702	11,619,205	11,096,561
2026	1,906,745	1,122,763	7,915,828	6,639,919	1,693,465	893,120	8,283,939	5,301,742	3,029,508	2,586,586	14,555,747	13,585,681
2027	2,141,647	1,150,392	9,990,652	7,793,084	1,870,654	915,633	10,079,700	6,220,031	3,292,039	2,786,287	17,783,735	16,299,731
2028	2,294,752	1,157,387	12,131,400	8,896,692	1,973,374	920,329	11,887,092	7,096,144	3,452,139	2,893,703	21,028,092	18,983,237
2029	2,374,396	1,151,617	14,337,529	10,010,605	2,003,806	913,758	13,712,293	7,983,188	3,526,013	2,917,564	24,348,134	21,695,481
2030	2,395,168	1,128,402	16,560,699	11,059,731	1,957,970	895,990	15,491,267	8,828,888	3,523,570	2,853,960	27,620,430	24,320,155
2031	2,343,010	1,120,965	18,783,285	12,140,770	1,834,043	890,165	17,197,109	9,688,085	3,463,974	2,724,208	30,924,055	26,885,194
2032	2,213,606	1,082,389	20,727,722	13,086,766	1,629,289	853,923	18,565,086	10,426,779	3,295,996	2,483,212	33,814,488	28,991,865
2033	2,055,326	1,036,614	22,529,619	13,953,487	1,389,698	811,204	19,714,537	11,093,147	3,091,940	2,200,901	36,483,107	30,807,684
2034	1,847,416	993,755	24,157,655	14,720,152	817,708	772,011	20,360,425	11,664,452	2,841,171	1,589,719	38,877,806	32,024,877
2035	1,732,839	976,101	25,773,217	15,475,010	602,938	748,979	20,887,862	12,213,185	2,708,940	1,351,917	41,248,227	33,101,047
2036	1,639,133	951,859	27,095,797	16,055,640	424,899	727,458	21,088,725	12,624,081	2,590,992	1,152,357	43,151,437	33,712,806
2037	1,568,946	928,766	28,373,916	16,555,865	286,506	704,534	21,181,206	12,964,882	2,497,712	991,040	44,929,782	34,146,087
2038	1,594,933	884,551	29,737,376	16,960,296	208,493	669,399	21,261,815	13,221,881	2,479,484	877,891	46,697,673	34,483,696

Long Term Conservation Potential

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 previously, 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.

Specifically, as discussed in the Portfolio of Measures section, building codes will pose a significant impact to Residential therm savings potential starting in 2022-2024. Furnaces have historically made up half of annual therm savings (insulation another quarter, tankless hot water heaters 5%, and the rest of the measures the last fifth). The anticipated new building codes regarding 92% AFUE furnaces will not provide the same level of therm savings between it and the higher efficiency incentivized 95% or a new 97% level. With lower therm savings comes lower cost-effectiveness and the Company expects to need to lower the incentive in the next four years to correlate with the lower therm savings. The Company will be seeking ways to make up this gap, for example by expanding the New Home certification options discussed under Emerging Technologies. Other opportunities for emerging technologies are found by the Company's engagement with NEEA.

NEEA Natural Gas Regional Market Transformation Collaborative

Market Transformation efforts are a key element to increasing accessibility of new technologies to the region's natural gas consumers. NEEA's purpose, as per their Draft Strategic Plan for 2020-2024 states:

> **"***NEEA is an alliance of utilities that pool resources and share risks to transform the market for energy efficiency to the benefit of consumers in the Northwest."*

As mentioned previously the Company's participation in the NEEA Natural Gas Collaborative has proven beneficial in a number of ways, not the least of which is increasing Company familiarity with its regional counterparts and their EE efforts through "long-term value-creating relationships including access to knowledge, new ideas, expertise, improved market power, shared expenses and shared risk."[9] Additionally, the NEEA collaborative has served an integral role in evaluating feasibility and accessibility to a number of natural gas products that had seemed more viable than was realistically available currently in the market. While proving a negative may appear counterproductive, these discoveries from the collaborative have helped steer efforts towards the more viable opportunities for improvement and expansion.

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 year of the contract and the Company looks forward to 2019 's efforts to transition into Cycle 6 and the continued joint partnership.

NEEA's work on the initial pilot efforts going into 2019 and further into Cycle 6 (2020-2024) are planned as follows:

- Gas Combination Space and Water Heating (Combo) Systems – The program is currently in the Scanning and Concept Identification phase and will remain primarily a scanning activity in the alliance's next Business Plan
- Condensing Rooftop Units – The program is currently in the Market and Product Assessment Phase of NEEA's initiative lifecycle. The product is planned to move into the next phase of the lifecycle in 2020 or 2021
- Gas Dryers – The program is in the Market and Product Assessment phase, with future movement uncertain due to the current lack of market interest in gas dryer product development
- Efficient Gas Water Heaters – The program is in the Concept and Opportunity Assessment phase of NEEA's Initiative lifecycle and is projected to move to the next phase, the Initiative Start and then into the Market and Product Assessment phase in 2019.

[9] NEEA Strategic Plan 2020-24, Draft May 2018 pg. 2

- Hearth Products – The program remains in the Scanning and Concept Development phase of NEEA's initiative lifecycle. Any program efforts remain centered around development of a low capacity hearth.
- Next Step Homes – This is an addition to the Natural Gas Collaborative's efforts and will begin funding the Next Step Home program at its current phase as Strategy Testing and Finalization moving into 2019. Potentially it may move to the Scale Up Approval milestone in 2018.

As mentioned in the two-year action plan the Company is also seeking to engage with the Collaborative not just at the committee level, but also within the organization's leadership as an equal voice and partner on the Board of Directors. In September Cascade Natural Gas and NW Natural were voted seats on the Board of Directors allowing for a more inclusive approach to market transformation from electric only, gas only and dual fuel funders alongside representatives from public interest groups, energy service professionals and regulators.

Funding & Cost Effectiveness

The Company's funding for the NEEA collaborative was initially calculated for the five-year NEEA pilot at a total of **$1,705,130**, as agreed in January 2015. In the event all the funds are not used within the cycle NEEA will return the Company's portion of the funding that has not been expended. 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 immediate claimable therm savings inherent as part of early roads into market transformation efforts. The Company will also calculate its cost-effectiveness with the NEEA membership dues included in the analysis to demonstrate its effect on cost-effectiveness of the portfolio. Table 12 shows the pilot's 5-year cost allocation for Cascade's participation.

Table 12: NEEA Annual Cost Commitment

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	$548,804
Total	$1,705,130

Cascade's participation within the NEEA efforts will continue as required, with efforts specifically centered on the Natural Gas Advisory Committee (NGAC), the Natural Gas Board Committee as needed and the Board of Directors workshops and quarterly

meetings.

A mid-cycle evaluation of the Collaborative's efforts occurred in 2017 which provided the funders and NEEA with 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.[10]

1. Most market actors believe NEEA's natural gas activities are valuable and significant
2. Committee members and NEEA staff feel the portfolio's core technologies have not advanced as far as hoped, but most interviewees remained 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 were varying opinions on progress, along with concerns regarding engaging with pilots that had not advanced far enough into the market and were at pre-commercialization levels
5. Most interviewed committee members did not believe a full integration of the gas and electric portfolios was currently feasible.

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

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

In 2018 the Board of Directors developed a separate Natural Gas Ad Hoc Committee to discuss results of the mid-cycle assessment, decide next steps for the collaborative and start discussions on the natural gas business cycle for 2020-2024. These discussions resulted in the recommendation to the board to propose a governance change allowing natural gas only funders a seat on the Board of Directors. Additionally, funding levels for the next cycle have been discussed and recommendations forwarded to the Board. Final full collaborative funding will be finalized once the Board reviews and potentially approves the 2020-2024 Business Plan in the December Board meeting. Individual funding contracts with utilities will be signed in 2019.

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 building stock assessments (Residential (RBSA) and Commercial (CBSA)) and have information relevant to natural gas service percentages throughout each of the years of the study. Cascade has a representative serving on the CBSA Working Group with the objective to engage with industry peers in a joint effort to improve natural gas resource availability throughout the Pacific NW (specifically statistically valid natural gas resources related to studies like the RBSA). This representation provides the Company an opportunity to advise on natural gas customer outreach, recruitment and dual fuel coordination with sister utilities. The Company is partnering with Cadmus to provide billing data where applicable, coordinate communication and facilitate site assessments for designated Cascade customers.

NEEA's RBSA, CBSA and IFSA (Industrial Facility Site Assessment) surveys were used to inform the Company's 2017 Conservation Potential Assessment (CPA) using, among other applicable data, Commercial and Industrial energy consumption, by square foot and employee basis respectively, and end use technology saturations. While these surveys have primarily been used to inform electric CPAs, the Company, and the CPA provider, identified a list of useful data that is applicable for gas customers in their Washington service territory. Triangulation of NEEA survey results, Cascade's internal data and secondary data sources provided a comprehensive and integrated baseline of current energy use by market segment for input into the CPA modeling tool, LoadMAP.

NEEA Next Step Homes

The Ad Hoc Natural Gas Board Committee agreed to engage in a dual fuel program offered through NEEA's existing electric market transformation efforts to leverage successes and access potential natural gas savings in the more immediate future. The program delivers market relationships, regional residential new construction data and

assistance in developing and launching utility programs. In 2019 its goals are to support utility awareness, education and understanding, improve coordination and regional alignment of programs and increase participation in its Performance Path for newly constructed high-efficiency homes. Starting at the end of 2018 and moving into 2019, NEEA will be meeting one-on-one with the gas funders to understand the goals and challenges of funders' residential new construction programs and seek opportunities to coordinate and align regional efforts. NEEA will be revisiting the program strategy and outreach activities, such as the BetterBuiltNW platform, to be more inclusive of gas specific opportunities. Additionally, the Company and NEEA will discuss how Next Step Homes activities and tools can support the Company's residential programs while working towards long-term regional natural gas market transformation. Cascade is especially interested in seeing how the Company can pair this effort to increase participation in the Built Green certification program, which is robust in its Climate Zone 3 and nearly non-existent in Climate Zone 1 and 2. AS mentioned previously NEEA's Board of Directors will be voting on and potentially approving the Business Plan and Operations Plans during the December 4th Board of Director's Annual meeting.

Outreach & Messaging Campaigns

The Company frequently reaches out to the public to notify rate payers of available incentives to drive uptake of the Conservation Incentive Programs – thereby optimizing pipeline efficiency. 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 EEIP to the public, and specifically Cascade customers. In addition to the integrated marketing approach, the Company is also employing a cross channel marketing practice where 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 out of necessity due to the nature of its mostly rural service territory and does not employ *all* possible channels of outreach since marketing is costly. The Company focuses on marketing channels that take advantage of existing messaging venues and synergies with 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, impactful and strategic in its placement.

The marketing world is rapidly changing with technology and social media opportunities. The Company's EEIP has centered on traditional messaging avenues and has ventured further into the social media realm to reach rate payers through more commonly used media channels while keeping focused on an integrated messaging model.

Currently, customers primarily obtain information and interact with the program through the program's website, www.cngc.com/conservation, local Trade Ally contactors, outreach events staff attend, the Department's dedicated customer service line, its third-party program implementation contractor for the C/I program, email and the Public User interface (PUI) online application portal, and by sending in a hard copy application through the mail or via fax.

In turn, the Company has multiple avenues in place to deliver program messaging including bill inserts, radio, events, community engagement and program material placement in external publications. Cascade also targets specific audiences. The Company has recognized increased savings goals require additional outreach and messaging to key audiences, which means additional funding and attention put toward specialized outreach.

The Company has refocused some of its efforts on brand awareness in the past year, taking lessons learned from the C/I program's lagging uptake in 2017 to rebrand all outreach materials to business customers with a consistent color scheme and format. The company's messaging campaigns have always included elements of consistency for brand awareness, now the message not only focuses on the EEIP's rebates, but also the direct benefit to customers offered through Cascade as their go-to for high-efficiency natural gas expertise. As always, the Company wants to assist customers by reducing the perceived and actual barriers in purchasing higher-performance appliances and weatherization measures by offsetting costs and improving accessibility.

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 or real-estate professional. 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.

Note, per discussion with the CAG samples of program outreach will now be provided as part of the Annual Report filed with the Commission as of June 1.

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 by the offerings provided through the Energy-Efficiency and Community Outreach Department. Energy program efforts outside of the Company programs are a valuable resource for the utility to leverage existing relationships to reach new audiences and reinforce the energy-efficiency message in new ways to existing audiences.

The following discussion highlights some of the community groups and areas the Company partners with:

Cascade regularly collaborates with community energy programs 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.

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 separate from the Company's 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 Company in providing personal interactions with community members to help them qualify and apply for rebates. Often, the community organization has made the final push to encourage customers to purchase higher-efficiency options by providing in-depth descriptions of how the different elements of the home affect their comfort, health and energy use. Having the ability to partner with local organizations has proven immensely beneficial. If a customer can look at their energy use on a whole home basis as opposed to a one-off upgrade approach the combined reduction and potential for consistent efficiency use increases dramatically.

Cascade has also found great value in coordinating with the Western Washington University Institute for Energy Studies. This partnership has grown for the past three years and been an excellent opportunity for Cascade to provide support to sustainability efforts on the campus with information about its EEIP, tabling at events and providing guest lectures about working within a regulatory environment, demand side management and associated efficiency programs for 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.

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 in the industry about various energy topics including efficiency and renewable resources. Goals include building leadership skills and supporting diversity in both energy studies and industry through the support and feedback of professionals. Participation is planned to continue into the foreseeable future.

In 2018, Cascade again partnered with regional utilities in the Tri-Cities area to provide an Energy Experience to local junior high students. The event's goal is to target middle school students and educate them about energy generation, production, safety, efficiency and conservation. Participation by Cascade helps increase awareness of natural gas as a source of energy in the home, teach how it is used, and in turn, how it can be conserved. It also provides an opportunity to talk about the Cascade rebate program in terms of home energy consumption and the importance of understanding how a home performs and can be audited. The event is slated to occur annually, and the Company will evaluate continued participation as a partnership between the district office outreach and EEIP messaging in 2019.

Cascade also uses radio to promote its EEIP when prudent. Timing is an important factor in placement of ads, not just for consistency, cost and fostering familiarity, but also has more value when considering the time of year and external influences on the customers. The EEIP is engaging in a pilot effort to promote its Trade Allies during the heating season (Fall 2018 into Winter 2019) when customers are starting to experience colder weather and considering higher energy bills. The current pilot is using a "donut" ad format. The Company provides a consistent message before as a template and offers a "feature" section where various Trade Allies within the pilot service territory are provided an opportunity to highlight their offerings to the community. The campaigns urge customers to engage in the EEIP by contacting qualified, knowledgeable contractors familiar with the EEIP's program requirements. The Company is doing much of the

legwork on behalf of the contractor and is funding the effort through the cooperative marketing budget, as few Trade Ally contractors have taken advantage of this benefit in the past. See below for a sample of the 60 second commercial script:

> ***ANNC**: WANT TO SPEND A COZY FALL CURLED UP IN YOUR WARM, COMFORTABLE HOME? CASCADE NATURAL GAS CUSTOMERS ARE ELIGIBLE FOR REBATES TO HELP WITH THOSE HIGH EFFICIENCY HEATING UPGRADES!*
>
> *CHOOSE A CASCADE TRADE ALLY TO INSTALL YOUR NATURAL GAS UPGRADES! THEY'RE FAMILIAR WITH CASCADE'S RESIDENTIAL HEATING REBATE PROGRAM AND CAN HYELP WITH THE APPLICATION PROCESS! YOU'LL LOVE THE SAVINGS ON YOUR UTILITY BILL AND THE INCREASED COMFORT IN YOUR HOME.*
>
> ***2ND ANNC:** (TRADE ALLY NAME) IS A TRADE ALLY OF CASCADE NATURAL GAS: CALL (TRADE ALLY) TODAY FOR YOUR GAS FIREPLACE INSTALLATION! BOB AND TOM AT (TRADE ALLY NAME) CAN GET THE JOB DONE WITH ELIGIBLE EQUIPMENT THAT'LL QUALIFY FOR CASCADE ENERGY EFFICIENCY REBATES! ONLINE AT TRADE ALLY DOT COM.*
>
> ***ANNC:** TAKE ADVANTAGE OF CASCADE'S REBATE PROGRAM WHEN UPGRADING YOUR NATURAL GAS APPLIANCES OR INSULATION! INCREASE YOUR COMFORT AND REDUCE YOUR UTILITY BILL, ALL WHILE SAVING ENERGY.*
>
> ***CHECK OUT CASCADE'S REBATES AND ENJOY THE REWARDS OF COMFORTABLE, AFFORDABLE, RELIABLE EFFICIENCY!***
>
> ***APPLYING IS AS EASY AS 1,2,3***
>
> ***ESTABLISH YOUR ELIGIBILITY AND FIND A LIST OF QUALIFIED TRADE ALLIES AT CNGC DOT COM***

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 four years the energy efficiency department has worked closely with the safety department on a joint message at baseball games. The Company updated this outreach format each year to influence diverse customer sectors. For instance, CY 2018 centered on the Hispanic community. Messaging campaigns are provided during the Walla Walla Sweets and Yakima Pippins baseball teams' seasons where the Company provides information about natural gas safety hand-in-hand with efficient use of natural gas. Overall program impressions in Yakima included 42,247 fans and exposure through a new team website which experienced more than 100,000 unique

visitors from May through August. In Walla Walla there were more than 125,000 unique visitors to the revised website. The campaigns also included the following elements:

- Four coupon distribution nights where a coupon including information on Cascade's EEIP was handed out to up to 500 fans.
- 2 3'x4' EE focused posters at the stadium entrance, one in English and one in Spanish
- 100 attendance tickets distributed on behalf of Cascade through the Hispanic Chamber of Commerce, Yakima Valley Farm Workers Clinic and local nonprofit Latino groups
- 30 second video board commercial during the Yakima game
- 30 second video commercial during the Walla Walla game
- 30 second Spanish radio live-read in Yakima
- 1 tabling night at each field for direct interaction of EE staff and fans about Cascade's offers
- Web-button linking to CNGC and the efficiency programs from the team's website
- 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!*

Energy efficiency messaging is provided when requested for support of District Office community engagement efforts including support of Longview's messaging during the baseball season. The Company will continue to support the District outreach in these territories but will likely redirect efforts for the following two years to alternative towns like the Bellingham Bells Baseball team to expand on the successes and lessons learned through participating with the two east side teams.

The Company leverages all opportunities to message to its customers about the energy efficiency programs whenever viable therm savings can be expected and are 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 format. This venue continues to be a productive and consistent format for providing efficiency messaging and updates to customers on program offerings. Historically the bill inserts have focused on residential offerings, however the Company has devoted the second and fourth quarters of 2018 to highlighting the commercial program to increase awareness and promote participation. Additionally, the Company will continue providing targeted messages to towns within its service territory through specialized inserts and has partnered with local community partners to highlight pertinent energy programs to complement the Company's EEIP. The residential application data frequently notes bill inserts as a key source of program information, second only to Trade Ally referrals.

Residential Focus

Local Home Builders Associations provide another consistent and judicious 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 and ENERGY STAR certifications. The Company attends Built Green meetings and events 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 homes, which in turn, provides the Company with a prime opportunity for outreach during associations' Home and Garden Shows and Home Tours. During these events, the Company often places advertisements in event brochures and in the homes on the tours. The Company attends such events in person to speak with customers and support local builders and Trade Ally Contractors by providing program materials and rebate information for distribution to attendees. These efforts will continue into 2019 and 2020 with the Home Builders Associations (HBAs) of the Tri-Cities, Central Washington, Skagit/Island County, Whatcom County, Kitsap County and others as deemed appropriate. In Skagit and Island County the Company takes an even more direct approach by remaining on site during a day of the Home Tour and discussing the EEIP rebate-eligible natural gas efficient appliances and incentives.

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 2019 and into 2020.

As the home owner/buyer is most frequently the decision maker in efficiency upgrade situations, it's also an opportunity for the Company to inform the industry helping home buyers with their purchases, i.e. the financial or loan industry. One of the primary barriers to installing higher-efficiency equipment in existing homes and businesses is the initial higher cost. 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. Financing was found to be available through the existing financial industry, including local banks' green loans, as well as through Trade Allies. Thus, this avenue will not be pursued further at this point as an offering. However, the Company will continue to monitor this sector.

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 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 EEIP conform to industry best practices ensuring the install meets expectations and has the best chance of achieving anticipated energy savings.

The Company frequently interfaces directly with contractors and builders through its Trade Ally network when questions or concerns arise during rebate processing. Communication includes periodic newsletters and emails to contractors addressing pertinent aspects of the program including updates, quality control inspections, best practices and customer case studies. As mentioned earlier, the Company provides a range of Trade Ally benefits to encourage sales of higher-efficiency natural gas equipment and measures. Cascade has found outside of customer referrals through the Company's website, the contractors most value bonus coupons, which provide an additional incentive to customers working directly through a qualified TA thereby helping

to close the sale on the higher-efficiency upgrades. The 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 (like the pilot radio campaign) for TAs along with reimbursements of specific training costs, such as those relevant to working with homes served by natural gas. The Company is hoping to directly sponsor some trainings for TAs in the coming year to support the potential for additional uptake of the less popular measures in the portfolio, like Air Sealing.

Growing the Builder Cohort

The transition to in-house rebate processing in 2016 resulted in greatly increased understanding and awareness of the rebate customer base. One element that quickly became apparent was that the program worked primarily with just three medium sized homebuilders and eight smaller custom builders who were regularly participating in the Company's Residential offerings. The third-party vendor had no relationship with, nor clear understanding of, the builders and their business models. Initial discussions with the builders created a better understanding of the barriers faced by this segment of the building community; no communication, rebate checks issued per home with no details provided to tie to a specific site, a lack of understanding around rebate applicability to builders, cumbersome single home application forms and more. By the end of 2016, CNGC had learned Builders are repeat commercial customers participating in a residential program and recognized improving energy efficiency in new gas homes required a dedicated focus. An Energy Efficient Builder Program was initiated with the following preliminary goals:

- Enable handling of builder rebates in batches for receipt, processing, and payment
- Build a dedicated, interactive, growth-capable database to manage builder account data, rebate batches, payment data, and builder specific reporting.
- Develop an application that could accept bulk rebate application data on a single document to ease application entry and processing
- Develop a robust payment program that could provide bulk payments with site specific, measure level details provided with the payment
- Focus realistic efforts, within staffing restraints, to build program participants and increase homesites
- To continually grow and improve builder use of the Residential Program to drive utilization of the program with multi-measure applications

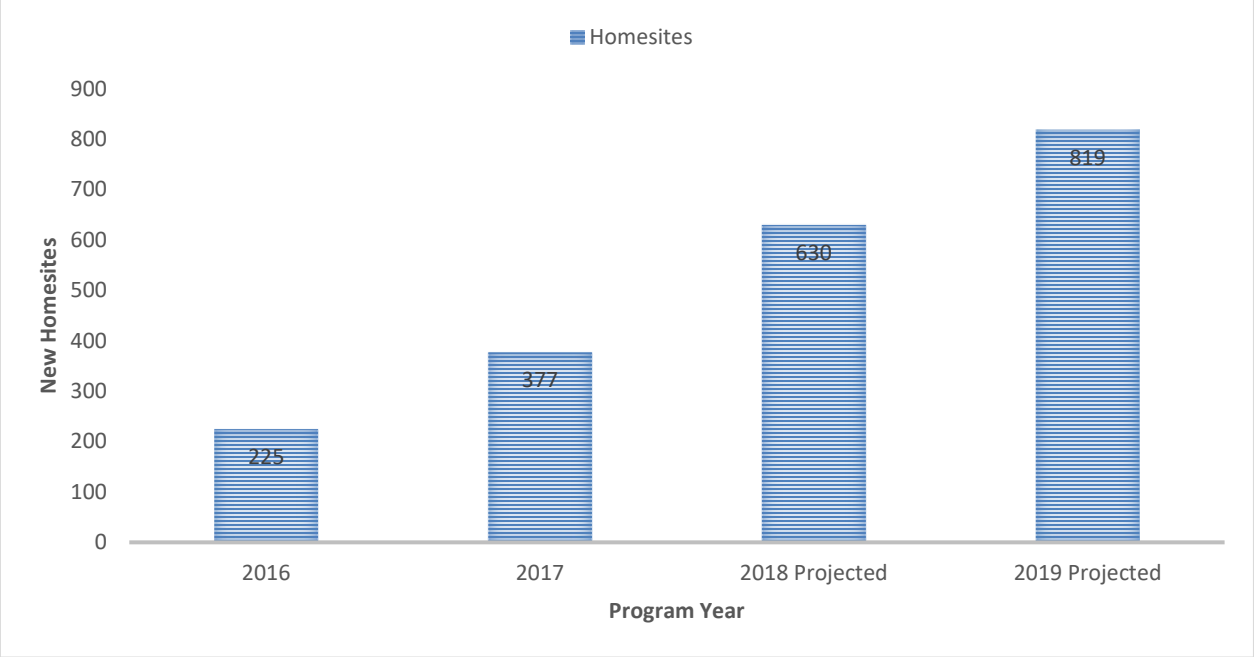
The Nexant processing software was not capable of meeting the batching and contact management requirements, so an in-house built Access Database with Visual Basic front

was constructed by year end 2016. This software program continues to be expanded and evolve as the program has evolved. Once the database was available active communication with the builders was ramped up. By spring of 2017 a beta test version of a builder electronic application (E-app) was in place with the capability of hosting 50 homesites in a single document. The E-app is now an Excel based document, which most builders have the capability to use. The E-app proved a viable resource for many of the largest builders and even some small builders prefer to utilize it. Ironically, there are very large builders who still prefer to submit single applications for every homesite, and the Company has found flexibility in providing options to accommodate builder preference has been key to growing participation levels. By the end of 2017, a builder payment detail report had been developed that reaches across both the Nexant and Access software to provide the desired bulk payments with site specific, measure level details available.

The 2018 program year has seen continued improvements of the payment system, greater efforts to reach out to new builders, and better communication with new builders through a rebate incentive sheet designed to focus on rebates applicable only to new homesites. The result has been extensive growth in multi-measure applications among the Company's largest builders.

With two years in place, the builder program represents, between 17-20%, on average, of total residential program applications received. The therms per application average 120% of a standard residential application due to the growing multi-measure uptake and highly efficient new home programs, such as ENERGY STAR and Built Green.

Figure 10: Builder Program 2016-2019



2019 Outlook

Builder Program homesite levels have been growing at a 65% year-over-year growth rate for the past two years. The Company anticipates this will slow to roughly 30% in 2019, which remains a significant strong growth rate to sustain. There are several reasons for the projected slowing in year-over-year growth:

- Many of the largest builders have already been brought into the program
- The largest current builder in CNGC's service territory has dropped out due to higher priorities
- The new home market is anticipated to gradually slow in late 2019 in the fastest growing CNGC service areas
- Two large builders have begun to electrify water heating loads to electric Heat Pump Water Heaters. The Company anticipates this trend will continue
- The program is now seeing the initial phase of builders transitioning to variable speed compressor multi-zone ductless heat pumps with gas backup furnaces. These homes are ineligible for rebates from Cascade as the remaining gas load is insufficient to achieve meaningful therm savings. The Company anticipates this preliminary electrification step will continue until code drives full electrification

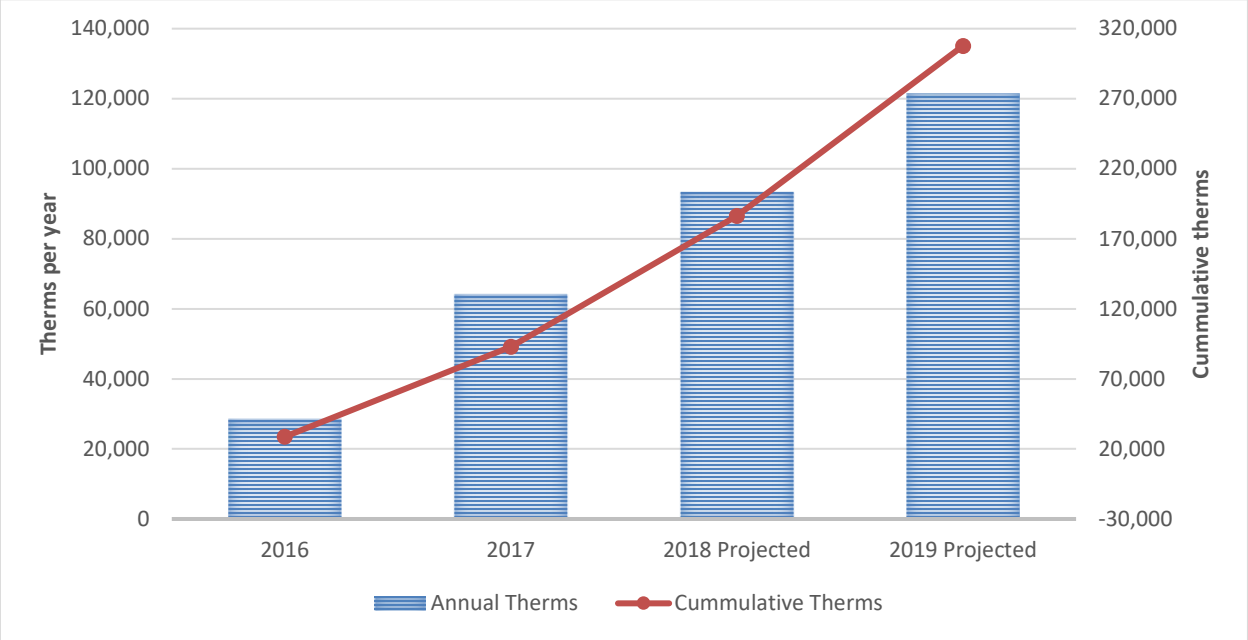
Despite these factors, CNG expects growth will continue for 2019 homesites and therm savings. During 2017 to mid-2018, the program allocated approximately 20% of a full

time equivalent (FTE) staff's time toward growing the program. Staffing increases in Q3 2018 have enabled this to shift to approximately 33% with an end goal of reaching 50% FTE in 2019. These FTE hours include rebate and payment processing, software upgrades, builder communications, and outreach.

The Company believes significant growth continues to be obtainable and will utilize the additional 2019 hours in several key areas:

- Continued, expanded efforts in more direct one-on-one outreach with builders.
- Field time to connect with builders in underserved areas.
- Analysis of additional code plus measures, such as multiple tier Built Green Program rebates and thermal break sheer wall installations.
- Modifications to the builder database enabling better tracking and account management of prospective builders for continued efforts to encourage the conversion to energy efficient equipment and new home program measures
- Coordination with NEEA's Next Step Home program seeking synergies and opportunities to leverage regional efforts.

Figure 11: Builder Program Therm Savings 2016-2019



Low Income messaging opportunities

Cascade continues to seek opportunities for additional messaging to customers and the low-income agencies, working with Agencies to encourage uptake of the WIP and EWIP offerings. The Company met with Agencies in mid-October 2018 and will continue

discussions with them on where increased outreach could be beneficial to increasing program participation. Some recommendations from participants involve sending direct mailers based on bill assistance data as well as use of sandwich boards for onsite messaging to encourage neighbors to think about the work being performed.

Commercial Focus

In addition to the Company's residential outreach efforts, Cascade also tailors messaging to Commercial and Industrial customers. Previously, outreach efforts 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 will continue as it 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 2018 Energy Leadership Summit where it submitted an ad in the program about the Commercial/Industrial offerings, featuring a satisfied rebate customer. This event plays a key role in promoting energy efficiency throughout the state to industry decision makers and the public.

Additionally, the Company continues to make a concerted effort to highlight installs with the highest return on investment potential and applicability to others to promote their accomplishments through case studies and oversized check presentations. These types of promotions provide a cost-effective venue to achieve press coverage and promote the program through best-practice examples.

The C/I program has been periodically placing program promotional materials highlighting past customer successes in Chamber monthly newsletters, business directories and Trade Organization websites and annual publications. The Company regularly attends and tables at Chamber of Commerce events including annual and monthly meetings and business expos to distribute both residential and C/I messaging and will continue to do so in the following years as opportunities arise.

Lockheed Martin, the Company's Business program implementation vendor, increased its outreach efforts on behalf of the Cascade EEIP in the past two years and is positioned to continue to further grow these efforts into 2019. Trade Ally outreach will be targeted throughout 2019. Additionally, the C/I program tried a few new outlets in 2018, including placement of three large billboard signs within the service territory for a limited time. This

one-time effort was strategic in picking billboards priced within the allowed budget and placed in key areas where the program was looking to increase uptake, including Aberdeen in Climate Zone 2 and Yakima in Climate Zone 3. The program will be seeking additional opportunities to target low performing areas like this in 2019 and 2020, as indicated within the two-year action plan.

The Lockheed team attends and tables at events on behalf of the Company to provide information about C/I program offerings and requirements. The Cascade team continues to monitor Lockheed's work within a major account management structure and will seek to leverage new business development efforts from within existing operations to build a more robust approach to reaching out to those C/I customers who are viable candidates for upgrades due to their usage patterns or as repeat program participants.

Online

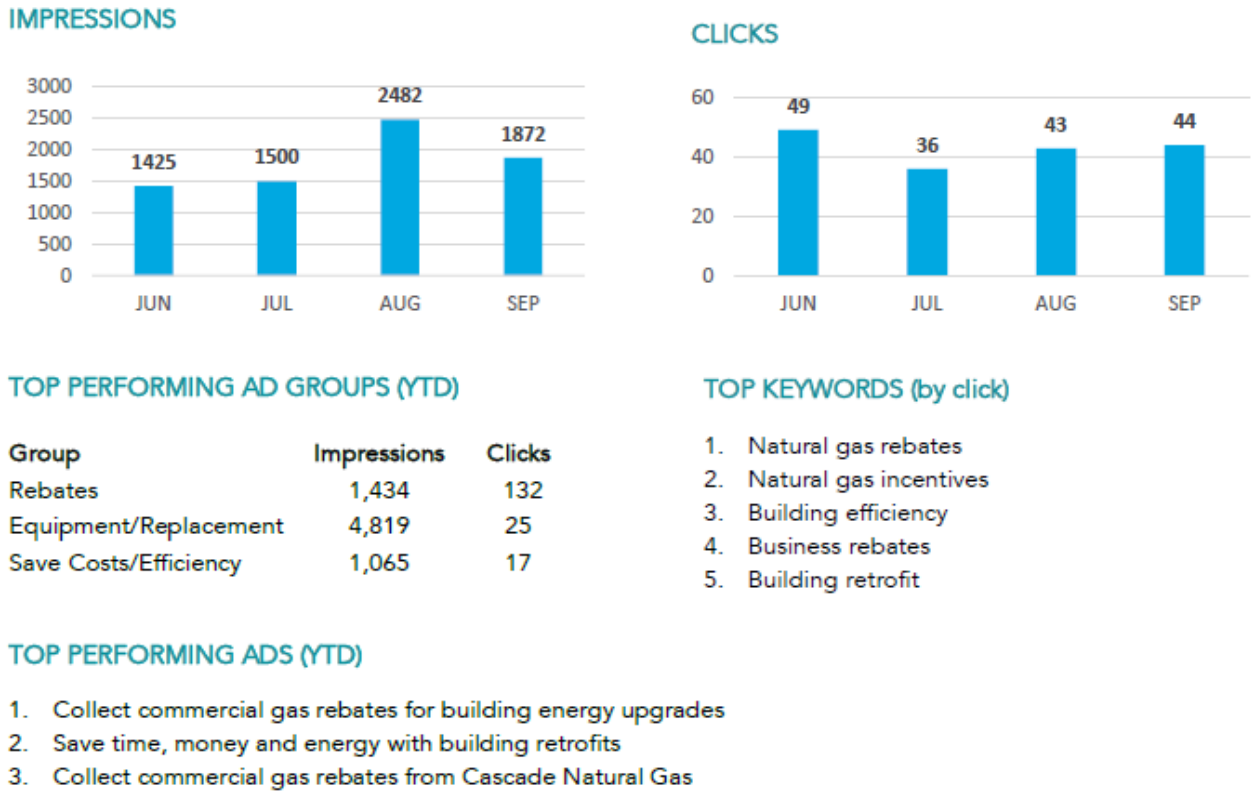
At the end of CY 2018 and into 2019. the Company is planning to take a critical look at its Conservation Corner microsite and evaluate opportunities to make it more effective and user friendly to customers seeking EE information. With the push for more aggressive growth of the EEIP, a strong online presence is expected and critical to increasing uptake. The goal is always to eliminate customer experience points of friction in applying for rebates and accessing information about energy-efficiency. The Company's Parent Company, MDU Resources, is in the process of revamping the public facing websites for consumers and is currently working with the EEIP group to incorporate the "branding" of the Conservation Corner more completely within the Company's main website. This effort will allow the EEIP to maintain the current nature of its website while:

- Improving user searchability from the CNGC.COM main website
- A modernized and streamlined look when seeking EE assistance
- Improved Search Engine Optimization
- Increased traffic (measured as visits per day)
- Consistent results with keywords: rebate, energy, efficiency, incentives, etc.
- Maintain a low bounce rate
- Accessibility improvements from desktop, laptop and mobile devices
- Clear direction for Oregon and Washington customers to relevant programs
- Additionally, the program would like to add the ability for a customer to verify equipment qualifications before applying for a rebate (qualifying measure list)

The C/I vendor has approached specific sectors of C/I customers where it sees an opportunity to influence similar business types. One such effort has been to seek out

senior living facilities throughout the territory. Through this strategic approach, the Company developed a video testimonial from one of its senior living facilities in Anacortes. The Company will explore additional YouTube options in the coming year. Additionally, the C/I program achieved more than 7,000 impressions and 174 clicks for a three-month investment in 2018 using Google AdWord. Overall, the campaign was successful given the low-cost. Future considerations include implementing a web form as the campaign call to action so the Company can track whether visitors coming from the campaign result in conversions. Also, improving the mobile optimization will lead to a far better customer experience and may result in more leads at minimal cost. See Figure 12 for further information.

Figure 12: Google AdWords 2018 Campaign Tracking



The C/I program has been closely tracking website visits to the business pages for improved understanding of traffic. Results will be incorporated into the website redesign to drive additional C/I interest. See Table 13 for a 2017 to 2018 comparison.

Table 13: Month Snapshot comparison of 2017 to 2018 C/I Website visits

Web page	September 2018 Unique Views	September 2017 Unique Views	% Changed
www.cngconserve.com	1,289	700	84%
/business	115	47	144%
/C& I application	26	24	8.3%
/ESK	16	-	-

The company is exploring new opportunities in online campaigns and social media marketing. While the EEIP has frequently posted online advertisements in the past, the social media outreach is spearhead by the corporate customer communications department. The company has started posting information on EEIP case studies, check presentations and outreach events through its social media platforms such as Facebook, Twitter, and LinkedIn, and is planning on working more closely with its parent company to influence its internet-savvy customer audience. It's important the EEIP mature in its outreach approach along with technology and take advantage of others' lessons learned. One key area for next year is to set social media schedules since timeliness has a significant impact to success of campaigns in that venue.

Keeping messaging current and the practice of talking about what *has* been done versus what *might* happen and *what is currently happening* will be an important consideration as the programs move into CY 2019.