CASCADE NATURAL GAS CORPORATION®

A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

TABLE OF CONTENTS

LISTS OF TABLES & FIGURES

Acronym Key

AEG- Applied Energy Group
AFUE- Annual Fuel Utilization Efficiency
C/I- Commercial/Industrial
CAG- Conservation Advisory Group
CBSA- Commercial Building Stock Assessment
CEC- Community Energy Challenge
CEEP- Community Energy Efficiency Programs
CNGC- Cascade Natural Gas Corporation
CPA- Conservation Potential Assessment
CRTU- Condensing Rooftop Unit
CY- Calendar Year
DBtC- Direct Benefit to Customers
DCV- Demand Control Ventilation
DHW- Domestic Hot Water
DOE- Department of Energy
DSM- Demand Side Management
EE- Energy Efficiency
EEIP- Energy Efficiency Incentive Programs
EF- Energy Factor
eM&V- evaluation Measurement and Valuation
ESAP- Energy Savings Action Plan
ESK- energy saving kit
ESR- Energy Service Representatives
EWIP- Enhanced Low-Income Weatherization Incentive Program
FE- Fireplace Efficiency
FTE- full time equivalent
FWB- Feasibility WorkBook
GEP- Global Energy Partners, LLC
GHPWH- gas heat pump water heater
gpm- gallons per minute
GTI- Gas Technology Institute
HB- House Bill
HBA- Home Builders Association
HDD- Heating Degree Days
HTR- Hard to Reach
HVAC- heating, ventilation, air conditioning
IECC- International Energy Conservation Code
IRP- Integrated Resource Plan
JUARC- Joint Utility Advanced Rooftop Control
LDC- Local Distribution Companies
LM- Lockheed Martin Energy
LoadMAP- Load Management Analysis and Planning
MDUG- Montana Dakota Utilities Group
MOU- Memorandum of Understanding
NEB- Non-Energy Benefits
NEEA- Northwest Energy Efficiency Alliance
NEI- Non-Energy Impacts
NESP- National Efficiency Screening Project
NFRC- National Fenestration Rating Council
NGAC- Natural Gas Advisory Committee
NWPCC- Northwest Power and Conservation Council
POS- Point of Sale
PRSV- Pre-Rinse Spray Valve
PUI- Public User interface
PVB- Property Value Benefit
QC- Quality Control
RBSA- Residential Building Stock Assessment
RFP- Request for Proposal
RTF- Regional Technical Forum
RVT- Resource Value Test
SC- Sustainable Connections
SCC- Social Cost of Carbon
SHGC-Solar Heat Gain Coefficient
SIR- Savings to Investment Ratio
SPIF- sales performance incentive fund
SWAG- Statewide Advisory Group
TA- Trade Ally
TE- Thermal Efficiency
TRC- Total Resource Cost
TREAT- Targeted Residential Energy Analysis Tool
TSPR- Total System Performance Ratio
UEF- Uniform Energy Factor
UTC- Utility Cost Test
WACC- Weighted Average Cost of Capital
WIEMN- Women in Energy Mentoring Network
WIP- Low-Income Weatherization Incentive Program
WSEC- Washington State Energy Code
WUTC- Washington Utilities and Transportation Commission
WWU- Western Washington University

Introduction

Cascade Natural Gas Corporation (Company, Cascade, or CNGC) has developed this Plan in consultation with its Conservation Advisory Group (CAG) as a roadmap to the 2020 and 2021 near term conservation strategy for reducing energy consumption through its Energy Efficiency (EE) Programs.

This fifth iteration of the Conservation Plan is intended as a companion planning document to the Demand Side Management (DSM) section of the Company's current 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. Reference to the 2018 Cascade Natural Gas Corporation Conservation Potential Assessment (CPA) 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. Upcoming outreach plans and ongoing community engagement

This Conservation Plan discusses potential savings determined for the Company's Washington service territory through its Load Management Analysis and Planning (LoadMAP) 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 2019 Calendar Year proved a challenging year for Cascade as deemed savings estimates per install were reduced by approximately 15% on average based off the last CPA for the Energy Efficiency Incentive Programs (EEIP). This change required a concerted effort on the part of program staff to drive uptake to offset the reduction after a

February 2019 tariff change signaled the reporting change to savings potential. When paired with a loss of staff due to attrition and unanticipated departures, the program was under-resourced throughout much of the year. Despite these hurdles, the EE group remains on track to meet goals set in the 2019 Conservation Plan and embraces its newly acquired personnel who bring a fresh approach and new ideas to operating in this carbon conscious environment. Additionally, the Company works diligently with its Commercial/Industrial (C/I) vendor to improve forecasting through a quarterly goal tracking process. This requires concerted effort throughout the year, as opposed to relying on a traditional end of year influx of applications. This deliberate approach is proving effective to keeping the program on track to exceed 2019 goals and will play a key role in driving C/I program savings throughout 2020.

The new year offers an opening to explore untried prospects through pilot efforts, a new focus on leveraging energy partnerships and allows the Company to pinpoint gaps in savings opportunities from hard to reach markets. Cascade must also continue to monitor local community efforts to reduce the use of fossil fuels as a part of citywide Climate Action initiatives, such as the City of Bellingham's Climate Action Plan. Cascade makes all efforts to share information regarding energy consumption and conservation incentives to support community engagement and the Company is committed to finding more ways to work jointly with its communities to minimize natural gas consumption through energy efficiency. The Company is also exploring options available through House Bill 1257, including carbon offsets and biogas initiatives.

1.1 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 unused energy as the result of energy efficiency. The Washington Utilities 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 energy efficiency 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 programs and outreach to reduce their individual demand for gas, Cascade can supplant the need to purchase additional supplies; displace or delay contracting for incremental pipeline capacity; and possibly negate or delay the need for reinforcements on the Company's distribution system.

Ultimately the Company can encourage customers to reduce their consumption to aid load management, however it is the consumer's choice to manage energy use. Ideally rate payers are able to recognize the inherent value of energy efficiency and implement efficiency upgrades whenever possible.

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. 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. 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 increased amounts of the more expensive peaking and seasonal gas supply resources.

1.2 Program Goals & Budgets at a glance

Table 1: EEIP Goals 2020 & 2021

	Calendar Year 2020				Calendar Year 2021			
	Residential	Commercial/ Industrial	Low Income	Total	Residential	Commercial/ Industrial	Low Income	Total
Admin Budget[1]	$1,036,849	$1,209,203	$56,900	$2,302,952	$1,068,000	$1,245,000	$54,000	$2,367,000
Therm Targets[2]	327,801	387,824	11,000	726,625	370,375	469,878	13,000	853,253
NEEA Natural Gas Market Transformation				$348,908				$348,908
Regional Technical Forum				$29,000				$29,725

[1] *Note budgets in this table are estimates and refer to administrative costs for program implementation, not rebate payments*
[2] *Therm targets from this graph have been developed through the LoadMAP modeling tool. Calendar Year 2021 target will be revised through the 2021 Conservation Plan as part of the annual planning process*

1.3 Performance Comparison

Table 2 notes Company therm savings achievements biannually compared to the 2012 IRP, 2014 IRP and 2016 IRP goals. Official totals for 2019 will not be available until the annual report is filed in June 2020, but as of early October the combined Residential and C/I portfolio are tracking toward a total annual savings of 801,005 therms. Despite the lower actuals to goals for the 2016 IRP biennium, therm savings continued to grow over

previous years, a reflection of the Company's drive toward increasing savings achievements. Furthermore, the Company's 2019-2020 biennium targets aim to boost energy savings proportionately higher, by 14%, independent of historic achievements. The Company's next IRP targeted for December 2020 submission will use updated avoided costs, discount rates and inflation rates.

Table 2: Recent IRP Goal to Actual Therm Accomplishments

Years	BIENNIUM	GOALS	ACTUALS	GOAL COMPARED TO ACTUAL	GROWTH OVER PREVIOUS IRP
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	1,324,030	**-9%**	**8%**
2018					
2019	**2018 IRP**	1,541,748			**16%**
2020					

*2019's final actuals are not yet available, however 2019 is tracking at 801,005 therms based on the year to date figures through the end of September, and then extrapolated to provide what 2019 is tracking towards by year end. Note this does not represent official achievements for the 2019-2020 biennium.

1.4 Budgeting Parameters

The Company provides the 2020 detailed estimate budget (see Table 3) to clarify elements included under the Direct Benefit to Customers (DBtC) allocation versus costs incurred as administrative expenses to implement the program. See Appendix A for a comparison to 2019's budget.

Table 3: Program Budgets

Program Budgets - Reflected in the 2020 CNGC Conservation Plan			
Incentive Estimates			
Program	**Budget**	**Allocated as DBtC**	**Notes**
Residential	$3,017,205	√	See Residential section
Commercial/Industrial	$1,216,930	√	See Com/Ind section
Low Income	$700,000	√	See Low Income section
Total Incentives	**$4,934,135**		

Non-Incentive/Program Implementation Expenses			
Program	**Budget**		**Notes**
Residential	$1,036,849		Staffing, software, marketing
Commercial/Industrial	$1,209,203		Third party program mgmt., marketing, CNGC coordination
Low Income	$56,900		Staffing, marketing, training, supplies
Portfolio Admin Total	**$2,302,953**		Residential, C/I, & Low Income (LI) Weatherization

Non- Incentive Expenses Breakout:	**Budget**	**Notes**		
Labor	*$758,157*	Company staff allocated 70% residential/ 30% C/I, low-income hours & part time temporary staff for seasonal processing		
Third Party Commercial/ Industrial Program Mgmt.	*$992,112*	Implementation, outreach for C/I EEIP, total for contractor coordination is dependent on vendor goal achievement		
Annual Software fees	*$195,500*	Residential & Low-Income rebate processing and data management, TA Program, Care Package/program update support		
Outreach / Trade Ally	*$304,300*	**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 program partnerships, e.g. Sustainable Living Center, Community Energy Challenge
		$3,000	√	Partnership with local Commercial energy program: Sustainable Connections
		$4,000	√	Customer Service Resolution
		$113,200		Trade Ally Support & Auditing
		$25,000		Professional Dues, e.g. AESP, WA Lodging and Restaurant associations, HBAs, etc.
		$64,800		Outreach: Campaigns, Web, etc.
Other	*$52,883*	$19,356		Miscellaneous & General Operating Expenses
		$15,762		Travel
		$12,630		Professional Development
		$5,135		Office supplies

Portfolio Admin Total (Included from above)	**$2,302,953**	Non-Incentive/Admin Expenses
Additional Expenses (excluded from DBtC)	**$377,908**	NEEA Market Transformation & Regional Technical Forum (Regional expenses)
Total Program Expense	**$7,614,996**	Incentives & Total Portfolio Admin & Regional expenses

Cascade set an administrative budget to plan and operate programs under the avoided costs shown in Appendix H of the most recently acknowledged Integrated Resource Plan. 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 to meet higher savings goals. Traditionally it geared toward a conservative approach to estimating costs. In practice, the Company frequently sought to decrease administrative expenses 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 to invest more heavily to meet goals.

Various benefit-cost ratios are modeled as part of the planning process to maintain a reasonable administrative budget and protect the EEIP's cost-effectiveness. The Company explores options at the portfolio level to determine which types of fiscal measures can be taken in the event an unexpected cost is incurred, economic conditions significantly vary from assumptions or participation levels do not meet ramp rate estimates. For 2020, the portfolio level buffer for cost-effectiveness equates to approximately $2.1 million, split between Commercial and Residential programs. This safety net allows for the Residential program to support a difference of up to $1.38 million and the Commercial $740,000 respectively and does not threaten the portfolio cost effectiveness.

While cost-effectiveness may be maintained as programs operate within the above budget parameters, the DBtC would be impacted based on the proportion of funds spent on rebates and/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 minimum 60/40 DBtC.

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

Additionally, the Company recognizes WUTC staff have directed the Company to achieve its targets and Cascade will make every effort to meet the goals, as noted in this 2020 Conservation Plan.

1.5 Direct Benefit to Customer Ratios

In January of 2017 Staff from WUTC engaged in a supplemental analysis of natural gas utility budgeting as a method of measuring program success. As part of this analysis the Company categorized its program expenditures under a ratio of DBtC compared to administrative program expenses while working with WUTC Staff and its Conservation Advisory Group to provide a higher percentage of direct benefits to customers.

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 Cascade program expenses are broken into the following categories (see Table 4):

Table 4: Direct Benefit to Customer Expenses

Cascade Natural Gas – 2020 DBtC Category Clarifications		
	Direct Benefit	**Program Delivery (Not included in DBtC)**
Residential	✓ Rebate payments ✓ Bonus coupons to customers for using qualified Trade Allies (TAs) ✓ Quality Control Inspections ✓ Local energy program partnerships promoting the EEIP by assisting customers with 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 for 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 operating expenses
Low income	✓ Rebates for weatherization ✓ Promotion of the program through the agencies to eligible customers	✓ Labor for program administration ✓ Travel expenses for program delivery

The Company will strive to reach this metric of success in the 2020 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 increased 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.

Table 5: 2020 DBtC

DBtC – Cascade Natural Gas 2020 Energy Efficiency Budget			
	Direct Benefit to Customers	Other Costs	Total Utility Costs
Residential	$3,095,505	$958,549	$4,054,054
Non-residential	$1,219,930	$1,206,203	$2,426,133
Low income	$720,000	$36,900	$756,900
NEEA			$377,908
Total			$7,237,088
Portfolio Ratio	**70%**	**30%**	

*For gas programs, NEEA and the RTF are excluded from the total budget DBtC ratio

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

In the *Cascade Natural Gas Corporation 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

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

  - 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 Northwest Power and Conservation Council (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 sales performance incentive fund (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 duct sealing
  - Expand the 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 LI Weatherization Incentive Program for the purpose of facilitating increased weatherization services delivered to qualified natural gas customers in Cascade's service area
  - The Company will meet with the agencies in-person at least once a year. 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. *See Appendix A for a status update on Action Plan progress.*

1.7 2018 Applied Energy Group CPA

As of 2014 the Company discontinued use of its first potential assessment study by Stellar/Ecotope and adopted a model and CPA performed by Nexant Inc.[2] The revised study was the first step toward obtaining a nuanced understanding of Cascade's Washington conservation potential. The study provided insights into the Company's overall technical, economic, and achievable potential. In addition, Nexant provided the Company with a planning tool to drill down to conservation targets for the IRP across the Conservation programs.

The model allowed the company to calculate potential internally through this third-party tool, however evolution of regional energy efficiency programs and processes found the methodology employed through the program no longer aligned with that of other Local

[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

Distribution Companies (LDCs) 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 under the methodology employed by the NWPCC to determine the Company's Achievable Technical potential. Cascade also required a new executable and dynamic model to support the potential assessment to allow for annual reassessment by CNGC staff to calculate the Company's Economic Achievable Potential over a 21-year forecast horizon.[4] Three vendors responded to the RFP and AEG was awarded the contract. 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. It is built in Microsoft Excel and is 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. It characterizes the baseline through base-year market profiles and projects the baseline. The user is then able to calculate the potential analysis under updated ramp rates influenced by Regional Technical Forum data. One of the key areas of improvement in the revised model included the ability for the company to develop its Achievable Technical potential as well as its Economic Achievable potential using multiple cost tests simultaneously 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]

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

Portfolio of Measures

Conservation program offerings are affected by fluctuations in natural gas, oil and other prices reflected in Avoided Costs. Appendix H of the IRP houses the adopted Avoided Costs, which remain constant for this iteration of analysis as the second year of the IRP biennial. Looking forward and taking into consideration natural gas futures and a healthy near-term economic outlook, avoided costs for the next IRP (currently due end of year 2020) will reflect an increase in per therm projections lending to more flexibility in program level offerings on measures across the portfolio. With natural gas expansion projects picking up in the coming years as more markets switch from coal to natural gas and greater pipeline transportation accessibility comes online, historically low gas pricing will give way to higher prices, particularly as global demand on the commodity continues to outpace production. This is compounded by the Unites States becoming the world leader in natural gas production and export.

The Company continues its commitment to offering meaningful conservation programs to help drive customer decisions toward higher-efficiency appliances and upgrades. Use of the revised model from AEG is integral to developing these programs along with the types of cost tests run, the inputs included within the model and ramp rates associated with each measure type.

The Company collaboratively works with the CAG to evaluate its programs through the lens of the Utility Cost Test (UCT) and the Total Resource Cost (TRC) in its Conservation Plan and Annual Report. Cascade has incorporated the TRC in its model in addition to the UCT and is reporting achievements under both parameters. Further information on TRC valuation and calculations within the LoadMAP model can be reviewed within the Company's 2017 CPA.[6]

Under the Company's 2020 proposed budgets and goals, the UCT benefit cost ratio is estimated on the portfolio level at 1.22 (1.29 for Residential and 1.15 for Commercial/ Industrial) and to have a 1.04 TRC (1.02 for Residential and 1.08 for 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 is closed.

[6] 2017 Cascade Natural Gas Conservation Potential Assessment, AEG Applied Energy Group, Volume, Final Report 04/16/18 pgs. 8, 14, 41, 62

2.1 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.[7]

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. This allows 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 toward 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 Company also recognizes the Commission prefers valuation based under a fully balanced TRC. Based on this directive the Company is determining next steps to more accurately identify Non-Energy Impacts within its portfolio of measures and is hoping to incorporate them into the 2019 Annual Report cost/benefit analysis, for release in June 2020.

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

2.2 Cost-Effectiveness Testing and Program Design

Under the UCT, rebate thresholds are set to achieve an optimal balance between driving program participation through persuasive incentive offerings while maintaining cost-effectiveness and ensuring a broad menu of offerings. The current incentive levels were reviewed with the CAG in October of 2018, and upon further analysis, resulted in a tariff filing with an effective date of February 19, 2019. See Appendix A for a copy of current Commercial and Residential rebate offerings.

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 incentive amounts, 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 its 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. 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. Please note discount rates will update with the next IRP cycle, with model runs using the revised discount rate occurring next year as part of the IRP process.

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:

> *"**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.*

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." [8]

This plan ran scenarios under the UCT, TRC and RVT. The company maintains the best test for maximizing potential therm savings is the UCT as it treats the rebate as a leveraged partnership that drives positive market change and best reflects the utility's investments in the offerings

2.3 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 increased the amount of incremental costs covered by the rebate. For CY 2018 the Company sought to develop a more customized approach to setting incentive levels through its LoadMAP tool. The intention was to adjust incentives to maximize individual measure uptake, rather than a basic 30 or 50 percent of incremental cost standard as previously used. The Company took a 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 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 Builder Program growth. Cascade continues to evaluate the viability of its incentives and increases where prudent at portfolio levels as it proposes rebate updates. This approach continues to drive the DBtC ratios at or above the 60/40 guideline set by the WUTC.

2.4 Program Offerings

All items offered at the time of this writing (October 2019) are based on the 2018 Integrated Resources Plan's avoided costs. Savings assumptions and targets were built from the AEG LoadMAP 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 2019 Annual Report which will be released in June 2020 will reflect the savings assumptions from the AEG CPA. While program planning for 2021 is part of this

[8] Per the 2017 CPA, Volume 1, Page 7

Conservation Plan, it will be updated at the end of 2020 to align with the new inputs and modeling runs from the next IRP.

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

2.5 Program Updates from 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 to obtain all possible efficiency available.

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.

4. Support a minimum 60/40 DBtC ratio between customer benefit and administrative 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 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 outreach to customers, the Company ensures ratepayers have access to behavior-motivating incentives and knowledge to encourage the purchase of cutting-edge, cost effective, gas

conservation technologies. This provides confidence they will result in meaningful energy savings. While 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 the Northwest Energy Efficiency Alliance (NEEA).

The following section provides proposed changes to the Residential and Commercial/Industrial programs and notes the C/I program offers custom rebates which include all viable cost-effective options, many of which are run through industry accepted engineering calculations to determine project specific savings potential. Table 6 notes the preliminary recommendations for changes to the 2020 Residential measure list including updated cost-effectiveness based on these changes.

Table 6: Residential Program Proposed Changes

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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	1.2	1.8	1.2	1.8
ENERGY STAR® Certified Homes + U.30 Window Glazing	$2,000	$2,000	1.1	1.6	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	1.2	1.1	1.2	1.1
Attic/Ceiling Tier II - R49	$1.00	$1.00	1.1	1.3	1.1	1.3
Wall Insulation	$0.75	$1.00	1.4	0.8	1.37	0.77
Floor Insulation	$0.75	$1.00	1.1	1.6	1.07	1.57
Whole House Residential Air Sealing	$150	$150	1.3	0.6	1.3	0.6
Windows (tier1 U-0.27, tier 2 U-0.30)	$5/sq. ft.	$5/sq. ft. and $7/sq. ft.	1.7	0.5	TBD T1 TBD T2	TBD T1 TBD T2
Duct Sealing	$150	$150	1.6	0.5	1.6	0.5
Duct Insulation	$0.50/linear ft	$0.50/linear ft	1.3	1.4	1.3	1.4
ALL HOMES	**CURRENT REBATE**	**PROPOSED REBATE**	**OLD UCT**	**OLD TRC**	**NEW UCT**	**NEW TRC**
Combination System (95 AFUE)	$1,250	$1,250	1.2	1.8	1.2	1.8
Boiler (30 yr. measure life)	$750	$750	1.1	1.6	1.1	1.6
Tankless Water Heater (one tier 0.91 UEF)	$250 & $350	$300	1.2 T1 1.1 T2	0.4 T1 0.5 T2	1.2	0.5
Energy Savings Kit 1 (removed after JULY 2020)	$20	$20	1.2	0.6	1.2	0.6
Energy Savings Kit 2 (removed after JULY 2020)	$40	$40	1.2	0.5	1.2	0.5
Programmable Thermostat	$25	$25	1.8	3.9	1.8	3.9
Exterior Door	$100	$100	1.1	0.7	1.1	0.7
Furnace (95 AFUE min)	$400	$400	1.2	0.7	1.2	0.7
Hearth/Fireplace (single tier 70 FE+)	$300	$300	1.2	1.1	1.2	1.1

*note acronyms: AFUE- Annual Fuel Utilization Efficiency; UEF- Uniform Energy Factor; FE- Fireplace Efficiency

2.5.1 Summary of Proposed Residential Changes

New Home Measures

In 2018, 14% of new homes participating in Cascade's rebate program took advantage of incentives available for a Built Green® or ENERGY STAR® certification. As Cascade works to increase participation for these two certification programs, it is important to offer a next best alternative to incentivize new home builders to install efficient space and water heating measures. Currently, 53% of new homes have a tankless water heater installed, and 62% of those tankless water heaters are 93% Uniform Energy Factor (UEF) tankless water heaters. To encourage more builders to install high efficiency space and water heating measures, the Company is proposing a $150 bonus for bundling concurrent installs of higher tier 93% UEF tankless water heater and a 95% AFUE gas furnace. This additional incentive will provide an alternative path to a highly efficient home to builders currently facing significant barriers in obtaining whole home certification through a program like ENERGY STAR and Built Green. In addition, the Company will explore a second tier of efficient Built Green home for 4- and 5-star certified homes in 2021, while working to partner with the NEEA Next Step Homes program.

A revision to section R403.1.1 of the 2018 (WSEC) will require new homes to install a 5-2-day programmable thermostat. Barring updates to this section, it will take effect July 1, 2020. This will impact Cascade's offerings for new homes as Cascade will no longer be able to incentivize the measure for new homes, although programmable thermostat rebates may still be promoted for existing homes. The language in the tariff will be updated to reflect a $25 rebate for 5-2 thermostats on retrofits, only. The Company will also revisit Smart thermostat savings in 2020 for their cost effectiveness.

Existing Home Measures

Uptake of the Whole House Air Sealing measure continues to lag despite program changes in 2019 increasing the incentive. The Company intends to revisit prescriptive Air Sealing in 2021. CNGC currently offers a $150 rebate for diagnostic Air Sealing, with a mandatory pre- and post-blower door test to quantify the reduced air leakage in the home. The proposal under consideration would add an alternative prescriptive Air Sealing rebate which consists of a checklist of air sealing tasks. The prescriptive Air Sealing measure would be expected to realize fewer average deemed savings and a lower rebate amount would be set accordingly with the intention to incentivize this best practice to ensure effective basic air sealing.

No change is intended for the Duct Sealing or Duct Insulation measures. However, the EEIP is considering requiring ducts be sealed before a rebate for duct insulation can be

requested. Sealing before insulation is a best practice model the Company wants to encourage.

In 2020, the company will investigate offering bundles for furnace and duct work performed simultaneously as a best practice and potential lost opportunity.

No change is intended for the Boiler, Combination System, Furnace or Fireplace measures.

In 2018-2019, Cascade experimented with a two-tier approach for tankless water heaters. Currently the two tiers are for 87% UEF tankless water heaters and 93% tankless water heaters. Prior to the two-tier approach, Cascade offered a single rebate for 91% + EF tankless water heaters. Energy Factor (EF) and UEF are not synonymous. In June 2017, the Department of Energy changed water heating ratings from EF to UEF to compare “apples to apples” and to standardize efficiency for all water heaters. Analysis of projects incentivized since February 2019 indicate 19 of 417 tankless water heaters qualified for the lower tier and had a UEF of less than 91%. This represents 4.5% of tankless water heaters incentivized through the residential program. Cascade is proposing removing the two tiers and offering a single rebate for tankless water heaters with a UEF greater or equal to 91%. The intention is to push customers toward the more efficient option, in addition to reducing the administrative cost tied to supporting a lower tier. This offering will be available to new and existing homes. Note a second tier of water heater was also added to the C/I program in 2019 and has proven more successful to drive additional program uptake.

The current Energy Savings kit will become obsolete with the upcoming legislative mandate, “on or after January 1, 2021, the [faucets and showerheads] may not be sold or offered for sale, lease or rent in the state unless they meet the state's efficiency standards.” Since these savings are going away, the proposal under consideration to maintain some savings potential would be to 1) characterize the market of high efficiency faucets and showerheads designed to perform above the standard and 2) determine how to qualify and incentivize CNGC water heat customers when they select their choice of qualifying efficient faucets and showerheads. Note, the net effect on total expected savings based on this update for the residential program is estimated to have around a 0.7% on average decrease to savings potential without development of an alternative offering.

The Company will explore whether it can offer a redeemable coupon with a fixed cash value to apply toward the purchase of an energy efficient faucet and showerhead of choice. The coupon format allows for a reduced admin fee from mailing, ordering,

tracking inventory, and shipping energy saving kits (ESKs), assuming options are available that would still recognize savings above the standards going into effect in 2021.

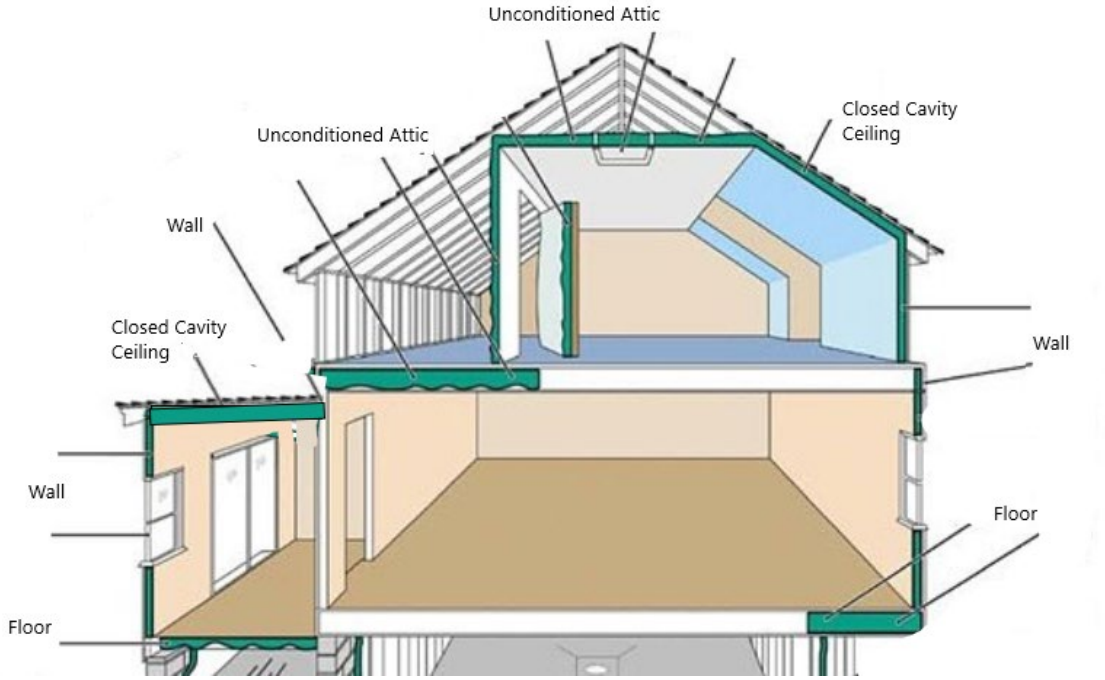
Cascade is also considering eliminating one of the tiers for the attic insulation measure. The Tier 1 offering of $0.75 for post R-38 residential attic insulation has experienced little uptake in the past 3 years. The last time Tier 1 attic rebates consisted of more than 10% of all paid attic insulation rebates was in 2017 before the tariff change. Since then, the paid R-38, Tier 1 projects have comprised 4% of the total attic projects in 2018 and 8% of attic insulation projects year to date.

Removing the R-38 Tier 1 offering will encourage customers to consider insulating to higher levels. New construction advises an R-49 attic insulation level per the 2015 WA Energy Code, and the Company drives to meet or exceed energy codes when possible. The EEIP has received rebates for projects with a new high mark for insulation at R-60. While this is not the norm, the program would like to encourage striving for the highest energy savings available while recognizing there are points of diminishing returns where additional cost are not sufficiently offset by increased savings.

The program will explore raising the rebate amount from $0.75/sq. ft to $1.00/sq. ft for wall and floor insulation (as supported through the Utility Cost Test). By increasing the rebate, the even dollar amount could simplify rebate estimates for contractors and customers. The Company anticipates this increase would influence additional insulation projects and encourage the whole home approach to weatherization through bundled projects.

The Company also proposes separating and creating two measures from the current Attic/ Ceiling insulation incentive. Attics encompass the space between the floor joists and the roof deck above the conditioned space. Ceilings, rather than attics, tend to be closed-cavity spaces such as flat roofs, vaulted ceilings or cathedral ceilings which limit the amount of insulation that fits in the space. The focus is still insulation between conditioned and unconditioned spaces, specifically the conditioned living space in the home and the outdoors. For ceiling insulation, a proposal of Pre-R levels not to exceed R-12 and Post R levels to be greater than or equal to R-30. If R-30 cannot be achieved due to a lack of space, filling the cavity to a minimum of R-19 is acceptable.

Figure 1: Insulation Types



https://www.energy.gov/energysaver/weatherize/insulation/where-insulate-home

CNG started offering a Window rebate in February of 2019. The minimum performance specification is associated with ENERGY STAR Northern Zone, a Prescriptive U-factor of 0.27 or lower. The Company has noted confusion in the marketplace due to the way ENERGY STAR Northern Zone specifications are written and has taken the past 10 months of experience into consideration in developing an alternative format for window rebates.

- There are four (4) different window U-factors eligible for ENERGY STAR Northern Zone see, Table 7:

Table 7: ENERGY STAR Residential Windows

Climate Zone	U-Factor	Solar Heat Gain Coefficient (SHGC)	
Northern*	≤ 0.27	Any	Prescriptive
	= 0.28	≥ 0.32	Equivalent Energy Performance
	= 0.29	≥ 0.37	
	= 0.30	≥ 0.42	

- Other Washington utilities offer rebates for ENERGY STAR windows at a 0.30 U-Factor minimum including PSE ($50 per window, $750 max), Snohomish PUD ($50 per window) and NW Natural ($3 per square foot).

- To drive savings and explore the investment customers are willing to make, the EEIP would like to explore a second tier for windows if cost-effectiveness limits can be met and still drive high-efficiency installations.

An update to the incentive sheet and rebate application requesting the National Fenestration Rating Council (NFRC) sticker for door rebates has been added to reduce administrative burden in confirming efficiency.

The company will research the possibility of removing Bundle A and expanding Bundle B to include Windows, Duct Sealing, Duct Insulation, Diagnostic Air Sealing, Attic, Floor, and Wall Insulation. Bundle B will remain at $500 if cost appropriate.

The EEIP will also research in 2021 the potential for incentivizing Heat and Energy Recovery systems for new construction and Gas Heat Pump Water Heaters may be a viable measure with enough availability in the market to consider including in the portfolio in 2021-2022 depending on market transformation currently underway through NEEA.

Table 8: Commercial Program Proposed Changes

Measures whose rebates were not adjusted IN 2019	Minimum Efficiency Requirement	Current Incentive	New Incentive	OLD UCT	NEW UCT
Condensing Unit Heater	Minimum 92% AFUE	$5/kBtu/hr	$5	1.17	1.17
Condensing Furnace	Minimum 91% AFUE	$5/kBtu/hr	$5	1.17	1.17
Energy Saver Kit A	PRSV <=1 gpm/ Aerators <=0.5 gpm	$119 (value – free to customer)	$119	1.95	1.95
Energy Saver Kit B	Showerhead <=1.8	$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 0.82 Energy Factor	$120/gpm*	$120	1.15	1.15
Tankless Water Heater 2nd Tier	Minimum 0.93 Energy Factor	$150/gpm	$150	1.38	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	$200	$200	1.30	1.30
Broiler	Minimum 90% Thermal Efficiency and 300 kBtu/hr input	$6/kBtu/hr	$6	1.37	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/hr input and steam pressures at 7psig or greater	$125	$125	0.87	0.87
Gas Fryer-Rest	>=50% Cooking Efficiency	$750	$750	1.43	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	$2,500	$2,500	1.34	1.34
Gas Conveyor Oven	>=42% Baking Efficiency	$450	$450	0.92	0.92
Ozone Injection Laundry	Minimum 125 lb Total Washer/Extractor Capacity and Pre-Approved by CNGC	$2,500	$2,500	0.94	0.94

Legend
removed
decreased
no change
increased

***note acronyms: DHW- Domestic Hot Water; gpm- gallons per minute**

Measures whose rebates were not adjusted IN 2019	Minimum Efficiency Requirement	Current Incentive	New Incentive	OLD UCT	NEW UCT
Radiant Heating	None	$15/kBtu/hr	$15	1.36	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	$2.00/sqft	$2.00	1.46	1.46
Tier 2 Attic Ins R-45	Tier 2 / Minimum R-45	$2.50/sqft	$2.50	1.28	1.28
Tier 1 Roof Ins R-21	Tier 1 / Minimum R-21	$2.00/sqft	$2.50	1.57	1.57
Tier 2 Roof Ins R-30	Tier 2 / Minimum R-30	$2.50/sqft	$2.50	1.39	1.39
Tier 1 Wall Ins R-11	Tier 1 / Minimum R-11	$1.25/sqft	$1.25	1.28	1.28
Tier 2 Wall Ins R-19	Tier 2 / Minimum R-19	$1.50/sqft	$1.50	1.27	1.27
Convection Oven-Rest	>=44% Cooking Efficiency, <=13,000 Btu/hr Idle Rate	$800	$800	1.39	1.39
Gas Griddle-Rest	>=38% Cooking Efficiency, <=2,650 Btu/hr Idle Rate	$500	$500	1.23	1.23
Low Temp Door Dishwasher	<=0.6kW Idle Rate, <=1.18 gal/rack	$800	$800	1.24	1.24
Low Temp Multi Tank Dishwasher	<=2kW Idle Rate, <=0.50 gal/rack	$2,500	$2,500	1.40	1.40
Hot Fluid Pipe Insulation – 1.5" in	>140F, <200F	$15/linear ft	$15	1.72	1.72
Hot Fluid Pipe Insulation – 2.5" in	>= 200F	$25/linear ft	$25	1.85	1.85
Bundle A: Any two insulation measures, min. 1,000 sqft		$500	$500		
Bundle B: Any 2 Kitchen equipment measures		$300	$300		
Bundle A: Bundle A: Any 3 insulation measures, min. 1,000 sqft		$500	$500		
Measures Added Last Time	**Minimum Efficiency Requirement**	**Current Incentive**	**New Incentive**	**OLD UCT**	**NEW UCT**
Windows	0.27 or Less U	$5/sqft	$7	2.38	TBD T1
Floor Insulation	Post-R > 30, or to fill cavity, pre-R < 11	$0.75/sqft	$0.75	1.13	1.13
New Measures	**Minimum Efficiency Requirement**		**New Incentive**	**OLD UCT**	**NEW UCT**
Windows (tier2 U-0.28-0.30)	U-0.28-0.30	N/A	$5/sqft	N/A	TBD T2

Legend
removed
decreased
no change
increased

Note there were slight decreases in UCT across measures with average variance of ~0.002 from 2019 to 2020

2.5.2 Summary of Proposed Commercial Changes

The Program does not foresee major changes in 2020 and/or 2021, see Table 8. However, as technology and program requirements require, changes will be reviewed and considered. In addition, there is opportunity to boost uptake with several measures.

- Mid-Efficiency Boilers. One potential new measure worth evaluating for 2020 is a mid-efficiency boiler (non-condensing but in the range of 87-88% AFUE). These boilers have gained favor with a large contingent of engineering firms, are less expensive than condensing boilers and will likely meet utility cost thresholds. These boilers are a proven technology and have been included within the custom program. The EEIP aims to encourage installation above code and while this measure is available through the custom program inclusion as a listed item in the prescriptive C/I EEIP draws attention to the offering and helps inform those unfamiliar with the custom program opportunities.

- Radiant Heating. The radiant heating measure is an attractive incentive and offers a great opportunity for growth in the future as it has seen minimal uptake for the past couple years. The program will explore a potential pilot and believes focused marketing could supplement with a case study, bill insert or distributor collaboration.

- Custom. There's a significant opportunity to promote custom projects with current cost effectiveness calculations. The Company's C/I program plans completion of a case study and video in Q4 2019, or Q1 2020 for a large custom boiler project in Sunnyside, WA. This will provide significant marketing leveraging opportunities to promote custom projects. Additionally, outreach efforts to increase awareness of custom opportunities will continue into the foreseeable future.

- Code Changes. 2015 Adoption of the International Energy Conservation Code (IECC) is still current energy code as of 1/1/2016 in the State of Washington, which is used as the Company's current baseline. No changes are required by code in 2020, although a new Appliance Efficiency Standards Bill - HB 1444 will require revisions to the C/I program offerings in 2021 (see Emerging Technology & Building Code section).

2.6 AEG CPA Library

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

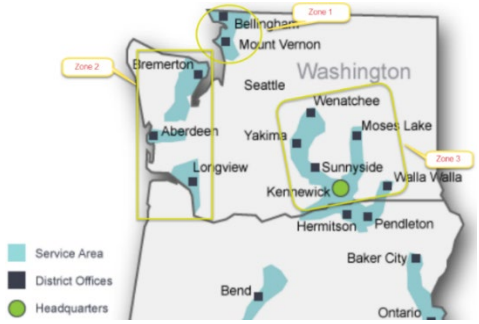
The full measure libraries for all customer classes were reviewed and updates to measure lives and incremental costs were made in the 2018 CPA. Incremental cost data was pulled from historic project data with instances of two outlier price points (more than double the max value of all other data points) 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 in late 2018 the Company took AEG's deemed therm savings for the Residential library and synced the therm savings for key measures. These adjusted therm savings per climate zone went into effect with the February 2019 tariff update.

Note adjustments reflected the unique climate zones noted in Table 9 for the Company's Washington service territory.

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



The Company is working with its vendor to revisit the savings assumptions for its prescriptive C/I program in light of the updates from AEG's study, as occurred with the Residential program in 2019, and is confirming where updates may be warranted moving forward. It will identify changing technologies and demands within the C/I sectors from the base year and will cross-reference what the vendor is finding on the ground in therm savings with further efficiencies the model is predicting.

2.7 Emerging Technologies & Building Codes

Cascade evaluates emerging technologies with strong potential for deeper natural gas savings in collaboration with regional partners like the Northwest Energy Efficiency Alliance (NEEA) and the Gas Technology Institute (GTI). Emerging technologies are assessed along a continuum for Energy Savings viability, Market and Supply Chain maturity and Risk, typically over a two- to five-year planning horizon.

In the Commercial sector, the modulating dryer retrofits show great promise and have been proven in both Illinois & Minnesota by GTI as well as SoCal. They consist of a 2-stage modulating gas valve, temp sensor, and control unit. Multiple studies have shown 10-20% gas savings depending on application with typical payback of 2-3 years per GTI. It will be available in Q4 and could be a valuable addition to the program for large commercial laundry facilities and hotels.

In the residential sector, several companies are working on developing gas heat pump technologies, which have the potential to make significant leaps in energy efficiency. One such application is a gas heat pump water heater (GHPWH). In lab and field tests the technology has demonstrated the ability to double the efficiency over a standard tanked gas water heater. Through NEEA, Cascade and other NW gas utilities are joining a North American field demonstration for this absorption gas heat pump product, expected to come to market in 2022 from a major manufacturer.

Another application of the same absorption gas heat pump technology is being tested by a major manufacturer for residential space heating and combination space and water heating. NEEA and others are supporting that field test.

Through NEEA, Cascade is participating in combi unit field testing in 2020. Two different products will be retrofitted in existing homes to better understand the real-world energy savings of these units, retrofit design and installation considerations, barriers to adoption and potential findings to influence commercialization of gas heat pump combination systems. NEEA plans to install two commercially available combi units/systems: one unit made by NTI and a Navien tankless water heater installed with iFLOW air handlers.

Cascade continues to engage with 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 to benefit customers in the Pacific Northwest.

Building codes and appliance standards have the potential to greatly impact the Company's rebate offerings, as Cascade does not incentivize upgrades and installations required by code. Washington State's building codes are largely national codes adopted and amended at a state level.

In Q2 2019 NEEA introduced a proposal in the 2018 Washington State Commercial Energy Code to increase the energy efficiency of heating, ventilation, air conditioning (HVAC) systems. The code update would require building designers to evaluate HVAC systems on whole-system performance rather than on individual HVAC components, which would significantly level the playing field for efficient technologies.

The proposed requirement includes an approach for engineers to calculate the efficiency performance of HVAC systems, called the Total System Performance Ratio (TSPR). TSPR is a methodology to establish relative whole-system efficiency for commercial

HVAC systems, rather than their individual components, which would level the playing field for efficient technologies, promote more efficient design approaches and help buildings save more energy. TSPR pilot projects will test the TSPR tool in real world projects prior to its code implementation in July 2020. The pilots will also help shape how TSPR can influence projects to exceed code requirements and report energy savings utilities can claim through incentive payments.

In addition, a revision to section R403.1.1 of the 2018 WSEC requires new homes to install a 5-2-day programmable thermostat as of July 2020. As mentioned, this will impact Cascade's rebate offerings for new homes as code will require 5-2-day programmable thermostat preventing Cascade from incentivizing the measure for new homes and resulting in a 35% reduction in savings potential directly from thermostats.

Washington's three energy House bills are still under advisement at the time of publication and a full understanding of the impacts to the company's EE programs are unclear; WUTC workshops are scheduled for Q4 2019 and early in 2020.

The 2019 Plan forecasted an increase in minimum water heating efficiency for multifamily dwellings from 90% to 95% Thermal Efficiency (TE) per proposed 2015 Commercial WSEC changes. This anticipated change has not yet occurred, and the code still indicates 80-85% TE for hydronic hot water boilers and 80% TE for Gas Fired Service Hot Water boilers. The C/I team will continue to monitor and update as changes occur.

As noted, the Appliance Efficiency Standards Bill (HB 1444) was signed by the Governor in 2019. This bill covers 16 products not regulated by Federal Standards and requires Cascade to incorporate updated faucet and aerator flow rates for Energy Savings Kit modeling in LoadMAP. For the C/I program the Company's Technical Manager will continue to analyze the impacts of the standards, but at a minimum the showerheads and aerators will require updates per the following parameters: Private Lavatory Faucets and Aerators - 1.2 gallons per minute (gpm) @60psi; Public Lavatory Faucets and Aerators - .5 gpm @60psi; Kitchen Faucets and Aerators - 1.8 gpm @60psi; and Showerheads - 1.8 gpm @60psi.

The current offering through the C/I program (.5 gpm aerators, and 1.5 gpm showerheads, and Pre-Rinse Spray Valve - PRSV .65 gpm) are all equal to or less than these flowrate limits, and do comply, thus no changes to the deemed therm savings for either C/I Energy Saving Kits is needed in 2020. However, when the new standards begin in 2021, ESK B will not be viable as the current offering is slightly above the new standards and will not remain cost effective based on the savings from the 0.3 gpm difference compared to the new more efficient baseline. There is no feasible gpm rate

currently on the market for either the showerhead or the aerator to continue as an above base offering with sufficient savings. This change will not impact ESK A, the PRSV.

House Bill 1257, the Building Energy Efficiency Bill (HB 1257), was signed by the Governor in 209. This bill increases energy efficiency and the use of renewable fuels to reduce the amount of greenhouse gas emissions in the state, and provides a public utility tax credit against the taxes for the incentives provided for implementation by eligible building owners of energy efficiency and renewable energy measures. The bill requires the Department of Commerce to 1) establish by rule a state energy performance standard for covered commercial buildings and 2) establish a state energy performance standard early adoption incentive program. Department of Commerce is holding a series of webinars and discussions on this rulemaking and its impacts to utility incentive programs. The Company will engage in the workshops and determine how best to comply with Commerce's needs and accommodate the program as it develops to establish baseline customer usage in covered properties. Additionally the Company will comply with guidance as to new utility responsibilities in delivery incentives either through existing or supplemental programs. The Company will also participate in WUTC rule makings on HB 1257 throughout 2020's discussion timeline to determine all potential program impacts.

Clean Energy Bill (SB 5116) addresses the social cost of carbon and the Company is evaluating the implementation of certain components of the act regarding energy markets, carbon issues, cap and trade, penalties, RNG and more as they pertain to natural gas.

Cascade is experiencing pressure from some constituent groups for policy driven electrification. Such changes will make it increasingly difficult for long term modelling results to truly be predictive. Currently the drive toward electrification is progressing naturally through efficiency and economically driven decision making in some districts, while in other areas it may be driven by policy mandating phase out dates for fossil fuels. Cascade 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 the Company's potential is calculated.

Cascade continues to monitor local community efforts to reduce the use of fossil fuels as a part of citywide Climate Action initiatives, such as the City of Bellingham's Climate Action Plan. Cascade has made all efforts to share information regarding energy consumption and conservation incentives. The Company is committed to finding ways to work jointly with its communities to minimize the use of natural gas through energy efficiency and is also exploring other opportunities enabled through HB 1257 including

carbon offsets and biogas initiatives.

Program Planning

The Company frequently re-evaluates its program offerings in the changing context of avoided costs, building codes and ENERGY STAR updates. This approach is consistent with how technology in 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 delivered programs. The Company's 2018 IRP provides information on environmental externalities (legislative bills as mentioned in the previous section) 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. CY 2020 will see increased discussions, workshops and Commission direction on implementation of the legislation passed in 2019.

The following section provides context on changes and efforts planned for the CY 2020 and CY 2021 EEIP and will require adaptability to accommodate recent rulemakings.

3.1 Conservation Programs in 2020

The 2019 CY was focused on goal acquisition, especially for the C/I program as it fell short of goal in CY 2018. The Company has been working closely with its C/I vendor to set and meet quarterly goals and evaluate where gaps remain to adapt and stay on track to exceed those targets. At the same time, the Company is maintaining a steady Residential rebate processing flow to keep the queue manageable and promote customer satisfaction. In the new year Cascade will continue to focus on goal acquisition, will stay engaged in local environmental policies with a focus on energy efficiency and will supplement offerings by developing pilots, leveraging partnerships and exploring hard to reach markets with limited historic participation.

The Company is planning the following efforts in CY 2020:

- The NEEA gas market collaborative is extending into its second cycle. The Company will continue working with the collaborative on the new operation plan activities for cycle 6 (2020-2024). A key element of the new cycle will involve reporting savings from the preliminary market transformation efforts. NEEA will provide a report to Cascade in April 2020 with calculated savings from 2019. The Company will work with its CAG on how cost allocations associated with the NEEA efforts will be determined once sufficient savings are accrued and reported.

- The Nexant iEnergy rebate processing software for the residential, low income and Trade Ally programs is up for renewal in 2020. The Company is likely to renew for the year with an option for additional time afterward, yet will evaluate program needs in 2020 to determine if an alternative processing software would be necessary. The evaluation Measurement and Valuation (eM&V) program within iEnergy should be available for the Company's use in 2020 which will enable Cascade to engage in internal eM&V. This will allow the Company to analyze actual program participation savings compared 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.

- The C/I program is on track to deliver on the targets for 2019. Should these goals be met the Company intends to continue program implementation through its program implementation vendor – Lockheed Martin Energy (LM Energy) through 2020.

- Monthly reconciliation – The Company added data integrity to its program tracking and auditing by including a project key identifier and increasing the frequency of accounting and project reconciliation to occur more frequently. This is expected to reduce the time spent in creating the Annual Report in spring as the cadence will be monthly as opposed to annually.

Additional areas the Company is considering updating in 2020 include development of program offerings as pilots for the Residential program and increasing partnerships with other utilities.

Pilots

A Point of Sale (POS) rebate program may prove beneficial to growing the builder cohort. Several builders have cited high opportunity costs as a barrier to program participation. Providing a POS for builders would reduce much of the administrative burden behind applying for a rebate. Moreover, many builders remain unaware of the program's new home rebates or learn of the offerings too late into the development process when equipment has already been purchased. A POS for builders would provide an avenue to influence contracts further upstream, providing a valuable window to choose high efficiency equipment prior to large quantity purchases. The Company would start with identifying builders

interested in participating and thoroughly reviewing potential hurdles and benefits to both the contractor and the program.

Regional Partnerships

Cross utility collaboration pilot on diagnostic energy audits for residential Puget Sound Energy & Cascade customers. The Company has analyzed the overlapping territory and is in discussions with PSE on collaboration opportunities. While full funding of audits is unlikely, there's potential to offset auditing costs for customers when they install multiple measures. Alternatively, the Companies could assist shared customers by coordinating with local energy programs through existing auditing offerings.

The Company will also review standardizing window requirements and rebate offerings between Residential and C/I and familiarity with both program requirements would encourage contractors to more frequently promote the rebates.

The language on the C/I incentive sheet for the tankless water heater will be updated to add clarity on efficiency requirements.

As part of the last Conservation Potential Assessment AEG estimated TRC potential, with a focus of fully balancing non-energy impacts and non-gas fuel impacts like electric cooling or wood secondary heating consistent with the methodology within the Seventh Power Plan from the NWPCC. Even with this focus AEG noted the UCT was a more realistic valuation of program cost effectiveness because of the difficulty in fully monetizing and quantifying these Non- Energy Impacts (NEIs). The Company is now seeking alternative methods to balance the TRC and will work with its CAG in CY 2020 to identify next steps.

As part of this process the Company will evaluate NEIs or Non-Energy Benefits (NEBs) for both the Residential and C/I program, seeking more granular understanding and reportability. The Company also plans on updating the residential NEBS as they are included in calculations in the 2019 annual report. Currently the C/I program is using two basic types of Non-Energy Impacts, namely Societal and Participant benefits in its TRC Benefit Cost calculation. No utility side benefits are included in the calculation as are sometimes included in these analyses. While there are many NEBs cited in the literature related to energy-saving endeavors, below are the subset the Company considers:

Societal NEBS

- Positive Economic Impacts to the Community – This is related to quantification of NEBs of the beneficial economic effect for the community, (i.e. job creation, sales tax receipts, etc.). The Company is proposing to quantify this effect using 50% of the retail value (at current average tariff cost/therm for each customer class) of the first year's therm savings as a conservative estimate of this benefit. This is a one-time benefit realized in the year of the installation.

  PEI NEB=.5(therm saved) * $.70/therm*

- Carbon Offsets – Ascribe a value for each ton of CO2 offset (based on therm savings) @$42/metric ton. These offsets accrue each year that the energy measure is in effect. To convert to a year 1 cost offset, take the present value of this stream of carbon offset $ over the life of the measure.

  CO NEB = PV (interest rate, measure life, ($42/metric ton x 11.6 lb. CO2/therm saved)/(2200 lb/metric ton))

Participant NEBS

- Property Value Benefit – Increasing the value of the participant's property value via installation of energy saving measures has also been mentioned in much of the literature related to quantification of NEBs that have a beneficial effect. Using 10% of the retail value (at current average tariff cost/therm for each customer class) of the first year's therm savings as a conservative estimate of this benefit. This is a one-time benefit realized in the year of the installation.

  PVB NEB=.1(therm saved) * $.70/therm*

- Reduced Maintenance Cost – Due to installation of energy savings measures, there are benefits derived via reduction in maintenance cost from improved operations systems and equipment. The Company ascribes a 5% of retail savings value (at current average tariff cost/therm for each customer class of the therm savings.) The benefits accrue each year the energy measure is in effect. To convert to a year 1 cost offset, the Company takes the present value of this stream of maintenance benefit $ over the life of the measure.

  MAINT NEB = PV (interest rate, measure life, (.05 (therm saved) * $.70/therm)*

- Water/Sewer Cost Reductions – For those measures that also save water, the Company recommends including a credit based on $2/1000-gallon water reduction. The benefits accrue each year the energy measure is in effect. To convert to a year 1 cost offset, take the present value of this stream of water reduction benefit $ over the life of the measure.

  WTR NEB = PV (interest rate, measure life, ($2 x 1000 gall))

3.1.1 Inspections

Residential Quality Control (QC) inspections are completed by one internal staff member in Climate Zones 1 and 2, and a third-party contractor in Climate Zone 3. The Company's third-party contractor, Sustainable Living Center, brings 15 years of community action and energy efficiency expertise to the Residential program. Highly respected in the community, they also provide low cost energy audits locally. Their staff currently performs Residential inspections for Cascade, with an option to expand those services to include Commercial Sector inspections if needed. Selective on-site visits with homeowners throughout the territory are paired with photographs of measures and equipment installations which provide verification of program requirements. Although failures are few and far between, those found during inspection are remediated immediately and re-inspected.

QC is an opportune time to seek customer feedback and better understand the applicant's experience and thought process to gain insights into contractor selection. The Company has also had many customers express gratitude and increased confidence in Cascade after participating in the Program to upgrade their home.

Residential inspections are completed monthly, with some variance depending on staff availability and weather. Currently Cascade is training an additional employee for Residential inspections to expand in-house expertise. The initial training consists of Building Analyst certification obtained through the Building Performance Institute. Topics include: Fuel Delivery, Combustion Safety Tests, CO Testing, Duct System Inspection, Hydronic/Steam Distribution Inspection, Infiltration Evaluation, General Home Investigation and Domestic Hot Water Inspection. The goal of the training is for the individual to focus on analysis of the physical phenomena affecting buildings. Through inspections, the analyst determines how well the building carries out its functions with an emphasis on comfort, health, durability and lower energy bills.

Residential applications are received most often from Climate Zones 1 and 3. Although Climate Zone 2 includes some populated areas, many of the smaller communities have recently experienced a state of economic depression barring residents from spending

funds on elective high-efficiency home upgrades.

The geographic targets for inspection follow the frequency of installation so inspections are completed more often in areas where applications are submitted. As noted, Climate Zones 1 and 3 experience the highest number of inspections since this is where most projects originate. As there is currently a lag in Climate Zone 2 the Company will continue outreach to this portion of the territory to enlist more Contractors and Trade Allies to serve customers in promotion of higher-efficiency heating options.

All customers are required to sign terms and conditions for the program advising eligibility may be contingent on passing a quality control inspection. In most cases, customers find in-home inspections valuable to confirm industry standards and the quality of their investment. When a random inspection is required initial project eligibility is verified prior to contacting customers to schedule an inspection.

In the coming year, the Company would like to increase the percent of residential projects inspected and will develop a process to accommodate the higher inspection rates which may require expansion of the Company's residential inspection contract to include Commercial sector inspections.

Cascade will also explore training opportunities to improve insulation project expertise through third-party trainers for both internal staff and vendors who perform QCs on the Company's behalf.

The C/I program also performs inspections on project installs. As with the Residential program, inspections for the C/I program provide both verification of measure and equipment installations as well as positive public-facing interactions for staff although the C/I program uses an alternative method to determine which projects are inspected.

For all three Climate Zones, inspections for C/I customers are completed by LM Energy. Customers are required to have an inspection completed for projects with an incentive payment of more than $5,000 except for six measure types including Radiant Heating, Condensing Boilers, Domestic Hot Water Tankless units and all insulation measures where the inspection threshold is $10,000. This allows for adequate review of project quality while not adding undue administrative burden.

Custom projects receiving a rebate over $5,000 are inspected by LM Energy's Technical Manager prior to final approval and payment to confirm efficiencies and functionality.

Finally, all C/I insulation projects installed by facility staff vs specialized insulation contractors are subject to inspection.

3.1.2 Commercial/Industrial Focused Updates

The Cascade C/I program foresees several opportunities for pilots, regional partnerships and access to hard to reach markets.

Pilots

Point of Sale (POS) – The residential program has experienced success with POS projects offered through a select number of Trade Allies. POS has been an option with the C/I program, however because the incentives are often larger they represent a higher risk for the contractor to absorb some cost should an error occur and has resulted in limited adoption on the commercial front. The C/I program will identify three contractors willing to participate in a C/I focused POS pilot in 2020 to drive uptake.

Radiant Heating Partnership – This technology's popularity is increasing, especially in the residential space, but there is also significant opportunity in the industrial and commercial space. Near mid 2020 the C/I program will explore a partnership opportunity with Grainger, a manufacturer that has already installed direct-fired radiant systems in CNGC territory.

HVAC Bundles – The C/I program will explore whether a bundle for facilities adding both high-efficiency HVAC (boilers, unit heaters, furnaces) and insulation would promote additional installations.

Building Certification for C/I – the C/I program has been in contact with the Home Builders Association of the Tri-Cities and is interested in piloting a program to focus on LEED projects or a Built Green-type of model for commercial new construction. This could be represented as a percentage increase above standard rebate levels should they be certified to higher tiered levels.

Regional Partnerships

The C/I program has significantly increased outreach to electric utilities in the past two years and will continue to look for more opportunities to partner with these utilities. Currently, the C/I program is partnering with six other utilities (PSE, Seattle City Light, Tacoma Power, Snohomish County PUD, Seattle Water and Tacoma Water) on a joint application for kitchen equipment. Additionally, the CNGC C/I program participates in TA trainings in Yakima and Walla Walla with Pacific Power, focused on program updates, new opportunities and program review. The CNGC C/I program has begun tracking cross utility walkthroughs and referrals in the monthly reports.

Joint Utility Advanced Rooftop Control (JUARC) - The C/I program is currently participating in the JUARC offerings with Puget Sound Energy, TCU, SCL and Snohomish PUD who utilize Rooftop HVAC equipment. The C/I team leverages the Demand Control Ventilation (DCV) controllers offered through this program whose prequalifying conditions are met by the JUARC technical specifications allowing all utilities to align. Most DCV control projects in the past 2 years have come from customers who are already participating with the electric utilities in the JUARC program with significant room for increased uptake.

Energy Savings Action Plan (ESAP) - Where joint walkthroughs are feasible, and where other utilities are willing to participate, the C/I team could create an ESAP, showing all potential measures (gas and electric) where energy efficiency can save on utility bills. This proposal would prioritize measures based on payback, incentives and need. Historically this has been a challenge as both utilities need to agree on the priorities. Some potential partner utilities have balked at these barriers in the past and will require a creative solution to accommodate.

Walkthroughs. Joint walkthroughs and analysis can also be challenging to align utility staff availability. However, a representative from BPA has recently reached out to the C/I team and will be conducting walkthroughs with the LM Energy C/I representative in Zone 3. The Company will seek similar opportunities with other regional utilities throughout its territory.

Hard to Reach (HTR) Markets

The CNGC C/I team will analyze participation data to identify regions with low participation. Based on the data, the C/I program will select 1-2 cities to focus on in 2020. The team will develop a TA/contractor strategy to recruit new TAs, send targeted mailers to promote program awareness and host energy-efficiency workshops to educate participants and contractors in these focused cities.

Energy-efficiency roundtables - For the past several years, the Energy Trust of Oregon Multifamily Program has organized EE Workshops with customers as a mechanism to engage property owners, managers and maintenance staff in areas with low participation. With the goal of driving savings and expanding program awareness throughout Energy Trust territory, these events support the program's overall customer account management approach and engagement strategy by encouraging new and existing customers to take action. In addition to educating customers on program offerings, these events provide an opportunity for the program to listen and learn from customers to better understand their unique challenges and participation barriers—insight that is crucial to future program

design and delivery. The team can replicate a similar event for contractors and Trade Allies in the identified areas.

Direct mail - Targeted and periodic mail helps spread program awareness to historically HTR markets. Marketing efforts will include direct mail throughout the year to increase awareness and drive savings with targeted regions. The team will send program offerings, case studies and perhaps a bonus opportunity to the identified areas to increase project count.

Data analysis – The CNGC C/I team will use new business intelligence tools to determine how to reach these HTR markets. An approach including, but not limited to, direct marketing to customers and partnerships with TAs and other contractors, as well as increased in person outreach should help reach these customers.

3.2 Conservation Programs in 2021

2021 will be an opportunity to further align with the business development efforts put in place in CY 2019 and 2020 from within Cascade as they mature. Additionally, there may be opportunities to look for synergies between the energy efficiency departments within the Montana Dakota Utilities Group (MDUG) and move toward an internally developed software platform.

Outside of internal collaboration the company will consider the following measures for inclusion in 2021 and beyond: Heat Pump Water Heaters; Laundry Water Recycling; Laundry Dryer Heat Recovery; Waste Heat Condensing Economizer; Waste Heat Pumps; and Advanced Rooftop Units (CRTUs). NEEA is currently conducting research on these units and has found the technology delivers on the estimated savings but is expensive to install due to the condensate requirements. As NEEA further reviews barriers the Company would be interested in promoting pilots within Cascade's territory to support further research as it has found this technology in high demand.

3.2.1 Planning and eM&V

Commission staff has recommended Cascade conduct internal, transparent eM&V of its Energy Efficiency program during between third party eM&V studies. Cascade and Nexant jointly developed a software platform to conduct internal, ongoing eM&V for a predefined sample of Washington Cascade customers who have participated in the EEIP and have one year of pre- and post-installation usage history. The Company developed the methodology and algorithms to cost-effectively conduct evaluation, Measurement and Verification within Nexant's DSMC software platform. Nexant has stated they are

now marketing the eM&V program to regional utilities including Avista, Tacoma Power and PSE.

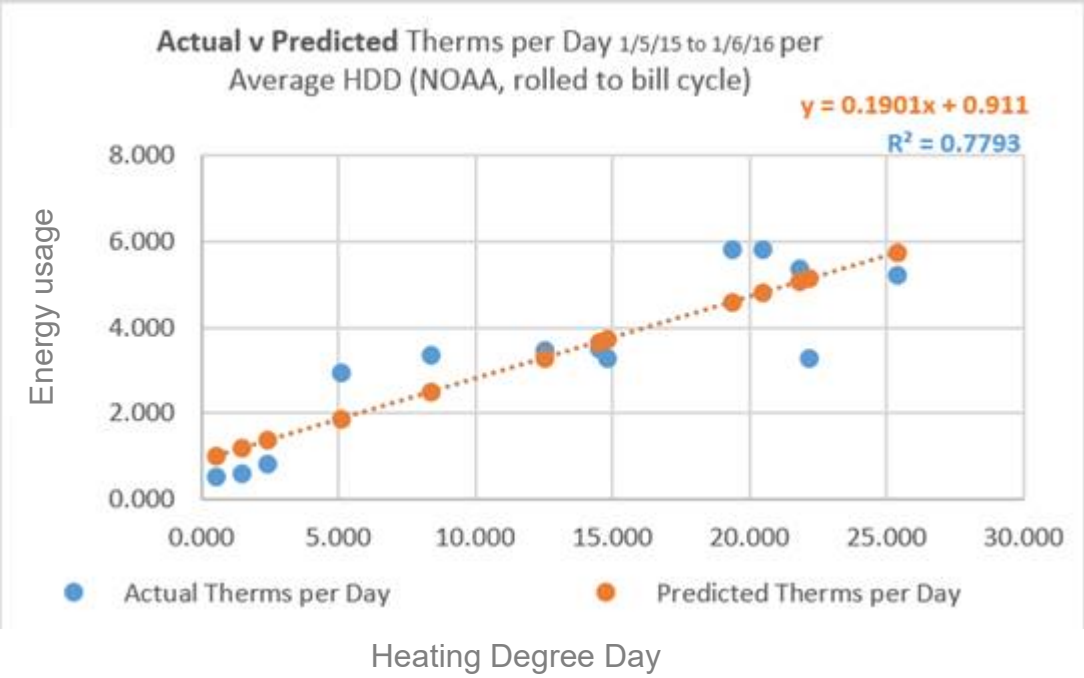
Process evaluation plays an important role in the overall context of a program evaluation. The primary purpose of the eM&V is to develop accountable recommendations for program design and operational changes that can be expected to cost-effectively improve program delivery.

The eM&V is a 5-step approach:

- Establish normalized baseline usage for each project
- Calculate therm/heating degree day correlation slope prior to installation set date
- Calculate predicted therm/heating degree day correlation slope after installation set date
- Plot actual therm/heating degree day slope after installation set data
- Calculate delta between 3 & 4 to establish EE impact

Figure 2 is a graph of twelve-month, actual vs. predicted therm usage, following the installation of a high efficiency gas furnace.

Figure 2: Example of normalized energy use regression analysis Actual vs. Predicted savings for a furnace



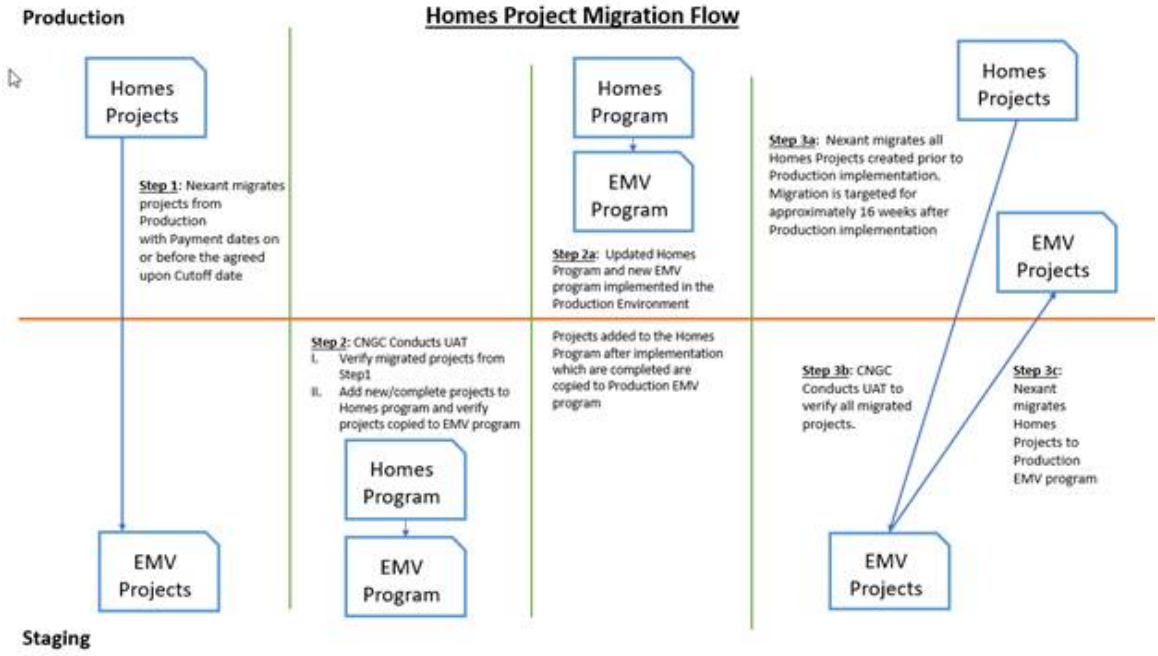
Following a review of CNGC's eM&V strategy with a Senior Vice President in Strategy and Planning, Nexant stated the basis of the approach was viable and calrified the Design of Experiments approach Cascade is taking can be understood as a lower-case "e" in eM&V practices.

There are two classes of measures: Non-equipment retrofits (that can operate in theoretical perpetuity) and Lost opportunity equipment measures where an incentive is designed to influence the buyer's decision.

- Nexant was looking for a baseline correction step and Cascade noted it is incorporated into the development of the Deemed Therm savings value from the Conservation Potential Assessment
- The Industrial sector has an Early Retirement class of measures which is not applicable to Residential
- Cascade would design a survey tool to collect pertinent demographic data to create additional context from externalities
- Cascade would incorporate a control group
- Cascade confirmed the size of its business creates a challenge for deriving statistically significant intelligence from the process and that the approach would require iterative cycles of learning
- The Cascade team would come back to Nexant with outcomes, so they could provide additional feedback and recommendations
- This process is an interim activity between third party eM&V cycles

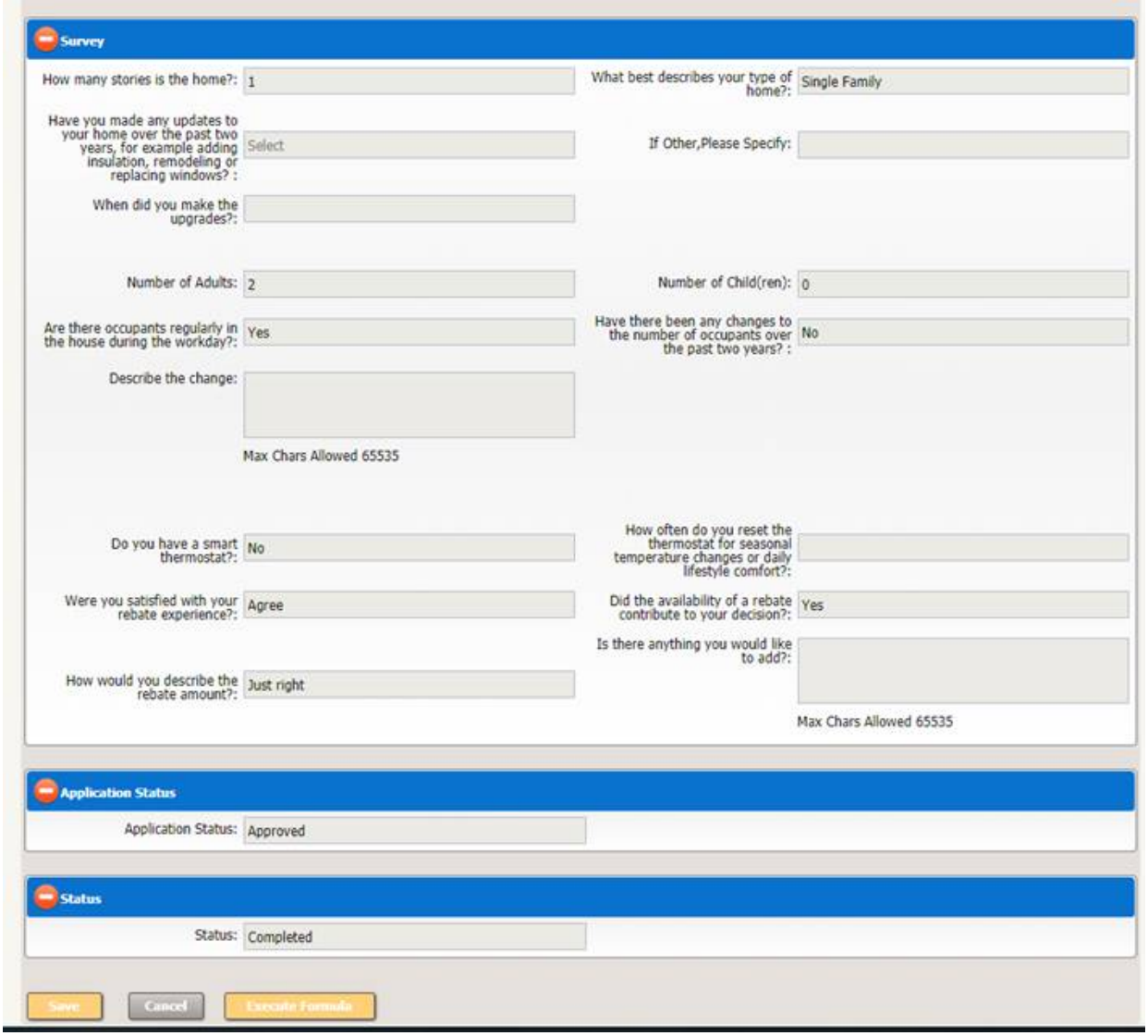
Once the program was placed on the Staging platform it became apparent more manual processing was required of Cascade than was originally anticipated to migrate the data to Production, which contributed to significant delays to the implementation timeline. Figure 3 shows the Staging and Production environments and the data migration steps post-User Acceptance Testing.

Figure 3: iEnergy DSM C software project migration from Staging platform to Production



The projects are processed through three filters. First, the completed projects are uploaded to an eM&V Landing page. Second, if the project meets data usage history specifications it is moved to the Selection page. Third, a randomized review of the project is performed to confirm eligibility prior to moving the project to the Survey page. Once the project is on the Survey form, see Figure 4, the customer is contacted for demographic data and whether any changes to the household size or building envelope during the data usage timeframe were experienced.

Figure 4: iEnergy DSM C eM&V Survey form for randomly selected eligible projects



The project has experienced significant delays, including the absence of Nexant's assigned programmer for over a month. Additionally, during testing it was determined the eM&V software could not handle decimal points, so a double conversion was required to accurately upload the therm usage from CNGC's customer database. Also, the Cascade team had to provide additional guidance on Baseload correlation and the Y intercept calculation. Despite the hurdles the eM&V program is expected to be in full Production before the end of 2019.

Following full implementation, a randomized sampling of eligible customer projects will be chosen for further evaluation. Customer surveys will be conducted to provide additional detail and understanding so the team can control, as appropriate, for variability

across projects. Deemed and Actual therm savings will be compared and evaluated for statistical significance and identified improvements will be implemented before launching a second cycle of eM&V.

3.3 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 outcome 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 Targeted Residential Energy Analysis Tool (TREAT) software or qualify as cost effective under the Washington State Department of Commerce Weatherization Priority List (or Policy 5.2.7-SF Deemed Measures).

On July 18, 2019, the Department of Commerce issued an update to all Washington Weatherization Assistance Program subgrantees indicating that Commerce had worked with Washington State University to evaluate software options and the DOE Priority List. The key decisions based from this evaluation include the discontinuation of the Priority List; continuation of TREAT; consideration of additional options for DOE SIR documentation for single-family units (such as Snugg Pro); and allowance of additional flexibility for complex multi-family projects that do not use DOE funds. The discontinuation of the Priority List will take place Feb 2, 2020. The Deemed Measures list utilized by Commerce to ease costs associated with the State's Prevailing Wage application to low income weatherization will remain an option for all projects without DOE funds.

Cascade will monitor the transition from the Priority List, and adoption of alternative auditing methodologies, and will adjust the WIP/EWIP tariff to synchronize with the new

requirements.

In addition, Cascade has actively engaged with its Advisory Group, the Department of Commerce, the Energy Project, and the agencies delivering the WIP/EWIP program to build upon the momentum of the Company's successful efforts to grow 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. We have also worked with individual agencies to generate awareness of weatherization program availability to qualified customers across various media channels. 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.

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
2018	26	4,716	$217,690.61	$8,372.72	$18.77

Preliminary findings for the 2019 Program year are as follows:

Approximately **50** projects were submitted as of October 2019, representing **10,234** therms saved and **$681,128.80** paid out to agencies with combined WIP and EWIP monies. An average of **$13,623** was provided as rebates per project this program year. This marked increase in participation reflects the success the Company and agencies have had in serving more low-income natural gas customers following the tariff revisions made by the Company on August 1, 2018.

As shown above, per-project spending continues to increase. This expenditure 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. Additional project expenses can be attributed to the increased price of labor under prevailing wage requirements. However, it's anticipated that a combination of legislative remedies, paired with the Department of Commerce's Deemed Measure List (waiving further cost-analysis for certain measures that do not utilize DOE funding) will help lower per-project costs for weatherization ongoing. Cascade is optimistic agencies will be able to focus on deeper energy savings in customers' homes as a result of these changes.

The Company is scheduled to meet with its agencies in early December 2019 to discuss the audit requirements of the Department of Commerce, anticipated program costs for 2020, and additional joint strategies the Company can engage in with the agencies to leverage program momentum and increase customer participation further.

The Company strongly appreciates its low-income agency partners and is committed to continuing to work with the Agencies and the Energy Project to ensure economically vulnerable households are served.

Targets Developed through LoadMAP

Cascade is providing targets for its conservation potential based on the inputs used for the 2018 IRP, including updates to the measure libraries. The administrative costs have been updated and are based on 2020's estimated budgets and expected contracts. The rest of the model inputs will be updated within the 2020 IRP.

Projected achievements are based on the Company's 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 to aim for the Achievable Economic goals.

4.1 CY 2020 & 2021 Targets

The Company has included the most up to date Achievable goals as per the LoadMAP model for 2020 and 2021.

The Company continues to explore the cost-effectiveness of measures included in the AEG review not currently offered in its portfolio. Those measures excluded from the current portfolio may not currently be available to the marketplace, administrative costs may be too high to implement, or other elements affect availability including fluctuations in Avoided Costs. The company will also monitor price signals from incentive levels for all programs.

Cascade 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, legislative requirements and technological developments.

The conservation potential for this Plan is calculated through the AEG LoadMAP model, separated into 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).

LoadMAP generated targets will be acknowledged in the conservation plan and the

Company will aggressively strive towards meeting them as committed. Regardless of goal achievement, the programs are built to ensure cost-effectiveness can be maintained, even if participation levels fall short, or admin costs run higher than calculated.

The conservation Program targets for CY 2020 are slightly more conservative than predicted in LoadMAP during the 2019 forecast. This is a function of a marginal increase in administrative costs across programs and cost-effectiveness across the portfolio realized a net decrease of approximately 4%. 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 impacts both cost-effectiveness and potential.

Figure 5 shows the biennium historical performance and short-term forecast while Figure 6 demonstrates the recent annual program performance and short-term annual forecast.

Figure 5: Incremental Portfolio Biennium Goals

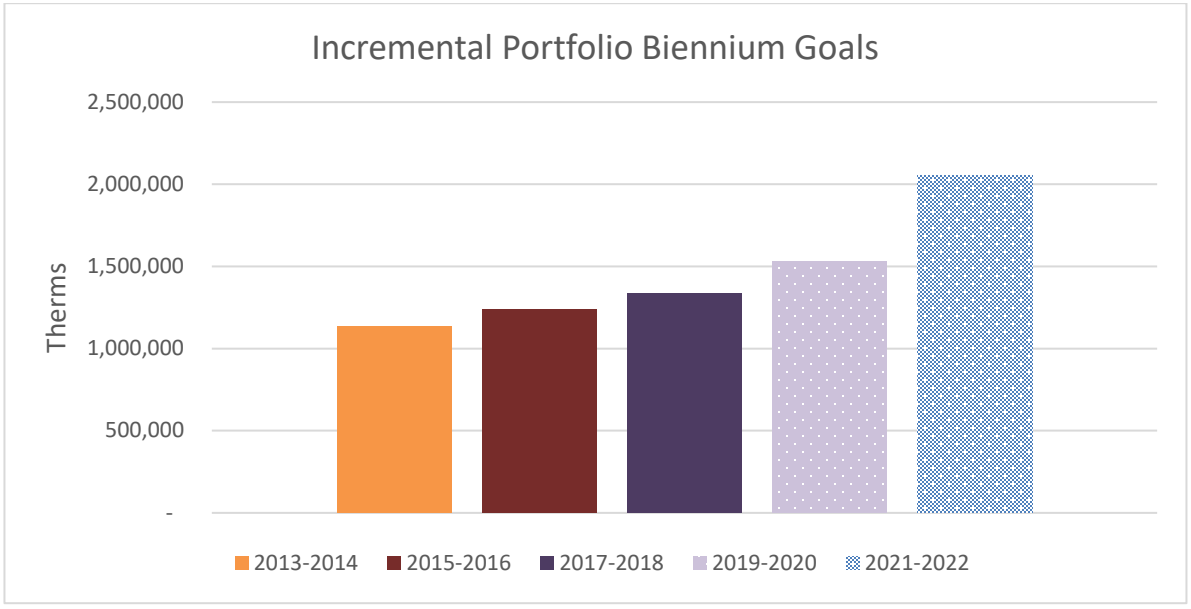
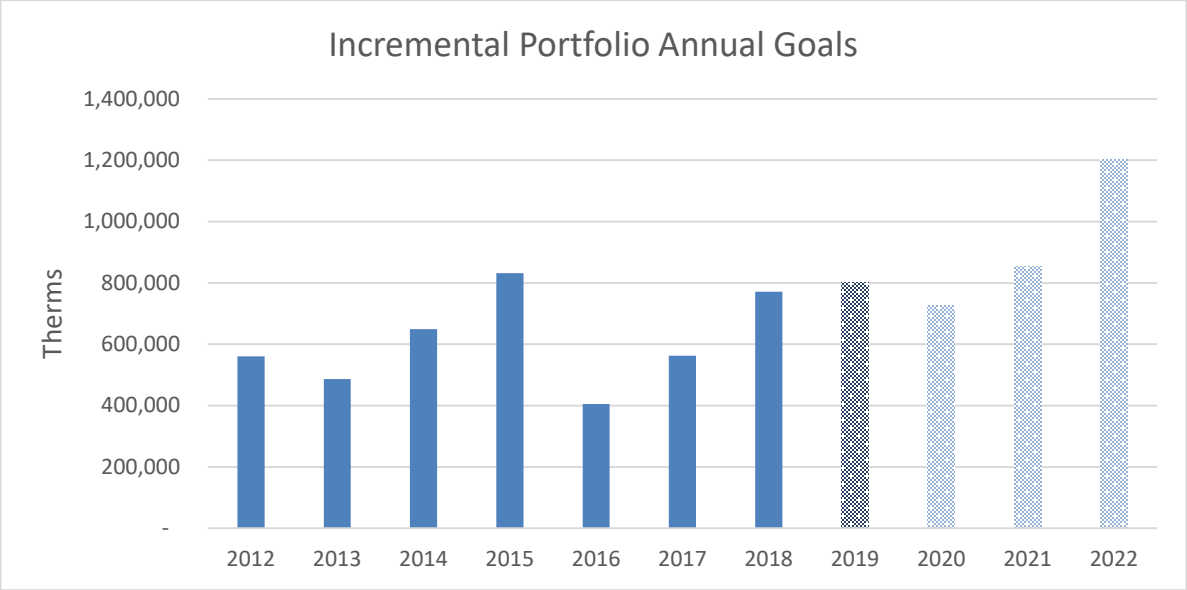


Figure 6: Incremental Portfolio Annual Goals



For this forecast, the AEG CPA estimated energy efficiency savings developed into three types of potential: Technical potential, Achievable Technical and Achievable Economic potential. 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."*[9]

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. Inputs include

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

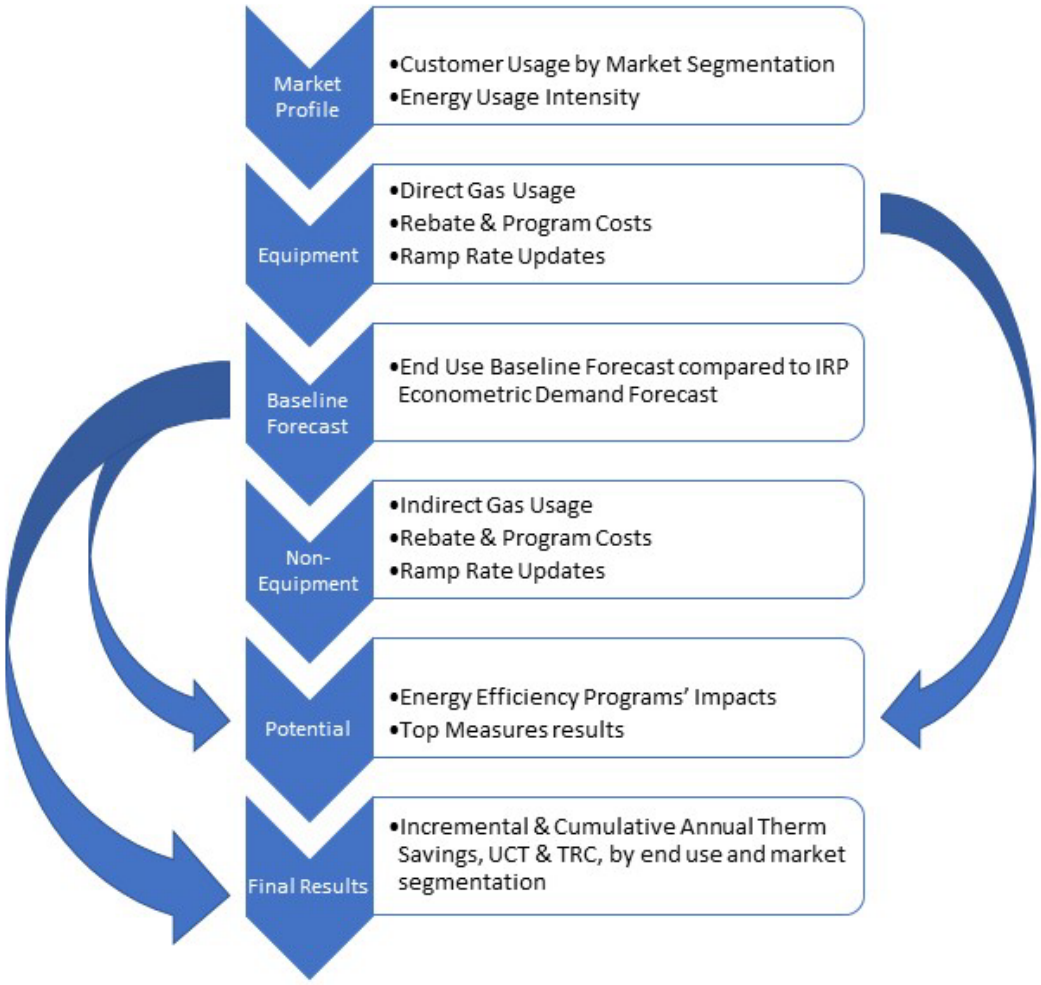
customer and demand forecasts, IRP long term discount rate, transmission loss rate and avoided costs as well as recent annual program performance and measure data collected through energy efficiency applications to establish incremental costs reflective of service territory. This model provides transparent 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 decision's consumers make regarding the efficiency of the equipment they purchase. Cascade's EE program adopted the Achievable Economic potential to set goals under an array of possible future conditions.

The following section 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 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 7 represents the 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 7: New Savings Potential Process in LoadMAP



LoadMAP requires administrative cost entry as a percent of the incremental costs in the Equipment and Non-Equipment models. This allows for input of administrative costs at a 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 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.

4.2 Market Segmentation & End Use

An important first step in calculating Cascade's energy efficiency potential estimates is to establish baseline energy use 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.

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 can 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.

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.

On September 12, 2019 the Utilities and Transportation Commission adopted social cost of carbon estimates from docket U-190730. Per these guidelines the Company incorporates a Social Cost of Carbon (SCC) through its avoided costs of 3% into the 2020 Conservation plan and will monitor and incorporate changes to the SCC within the 2021 Conservation plan through the updated avoided costs developed for the next IRP.

4.3 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 target completion.

4.4 Assumptions and Inputs

The unique inputs used for climate zone market segmentations in the Residential forecast were customer count, demand forecasts, and budget adjustments. 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, remaining consistent with the 2018 IRP:

- Inflation rate at 1.00%
- Transmission Loss rate at 0.1615%
- Long-term discount rate at 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.

4.5 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.

4.6 Residential Scenarios

The model was run individually by climate zone for the Residential customer class to provide increased granularity. Figure 8 provides the Residential cumulative potential, with outcomes by climate zone reflected in Figure 9.

Figure 8: Cumulative Potential Forecasts for Residential

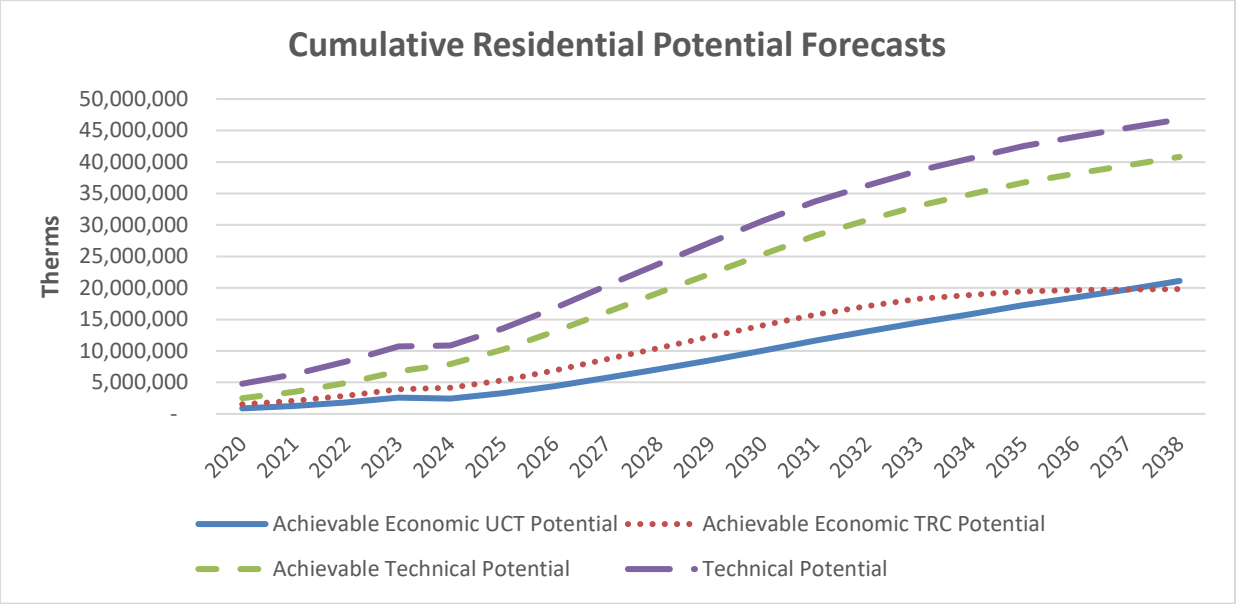
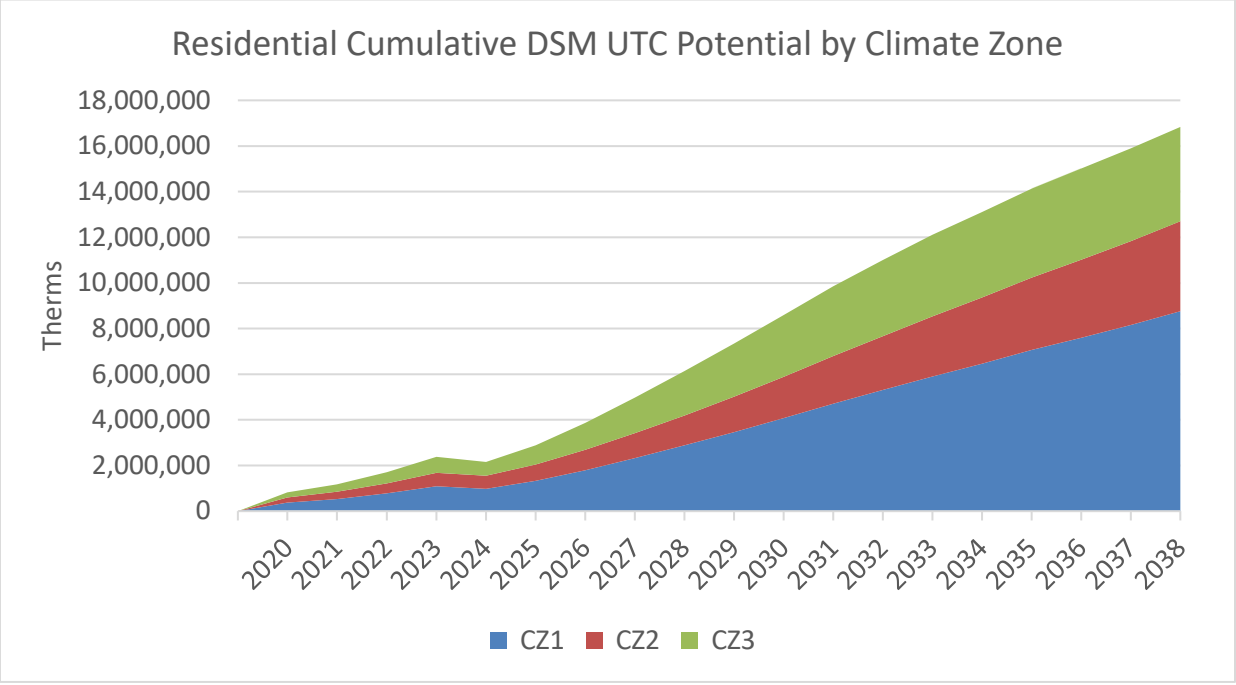


Figure 9 shows the Residential portion of the DSM forecast, split by climate zone.

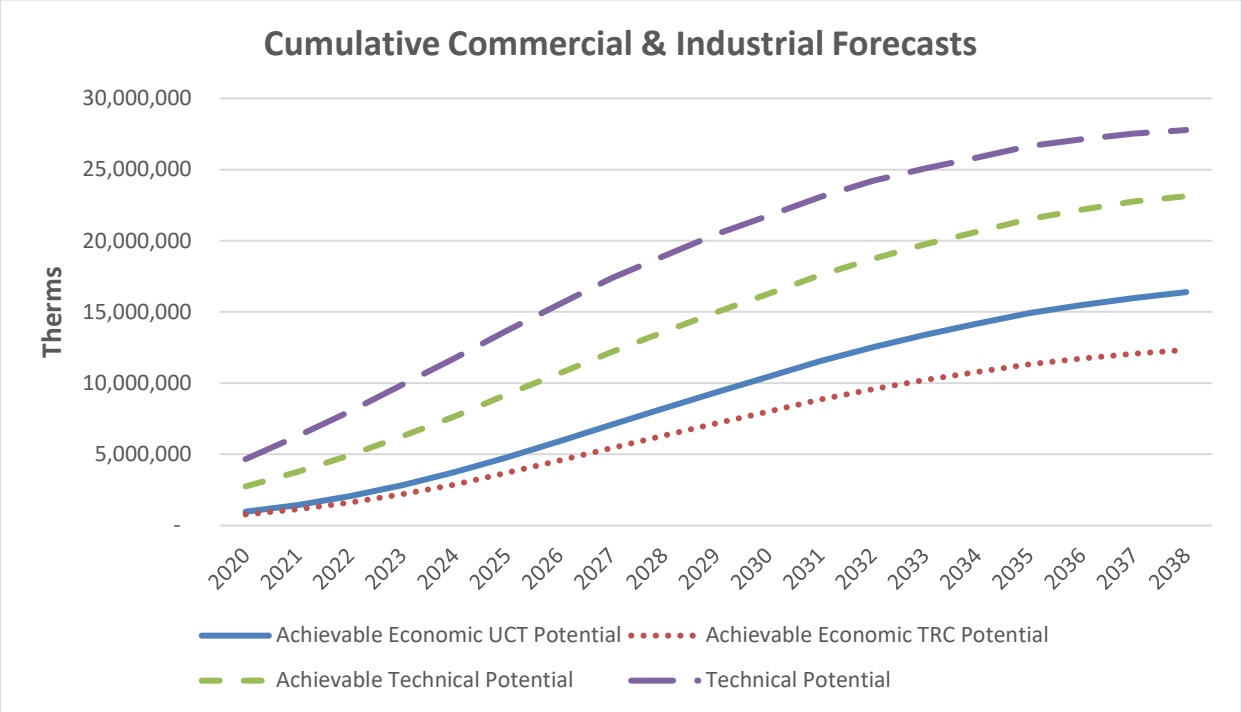
Figure 9: Residential Achievable Economic UCT Potential by Climate Zone in Therms



4.6.1 Commercial/Industrial Scenarios

Figure 10 shows the cumulative DSM forecast for the Commercial & Industrial sector by Technical, Achievable Technical and both UCT/TRC Achievable Economic Potentials.

Figure 10: 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 2019 has experienced a change in prescriptive to custom proportions, and is currently tracking above 66% prescriptive.

4.6.2 Combined Residential and C/I Portfolio Potential

Figure 11 shows the cumulative DSM forecast by Technical, Achievable Technical and both UCT/TRC Achievable Economic Potentials.

Figure 11: Cumulative Potential by Forecast

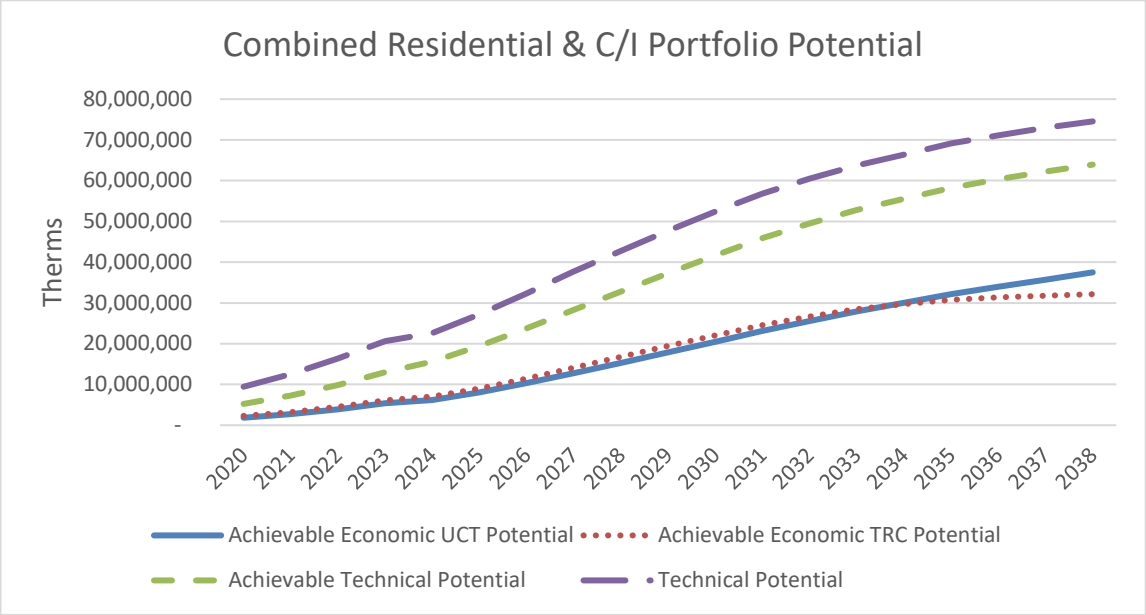
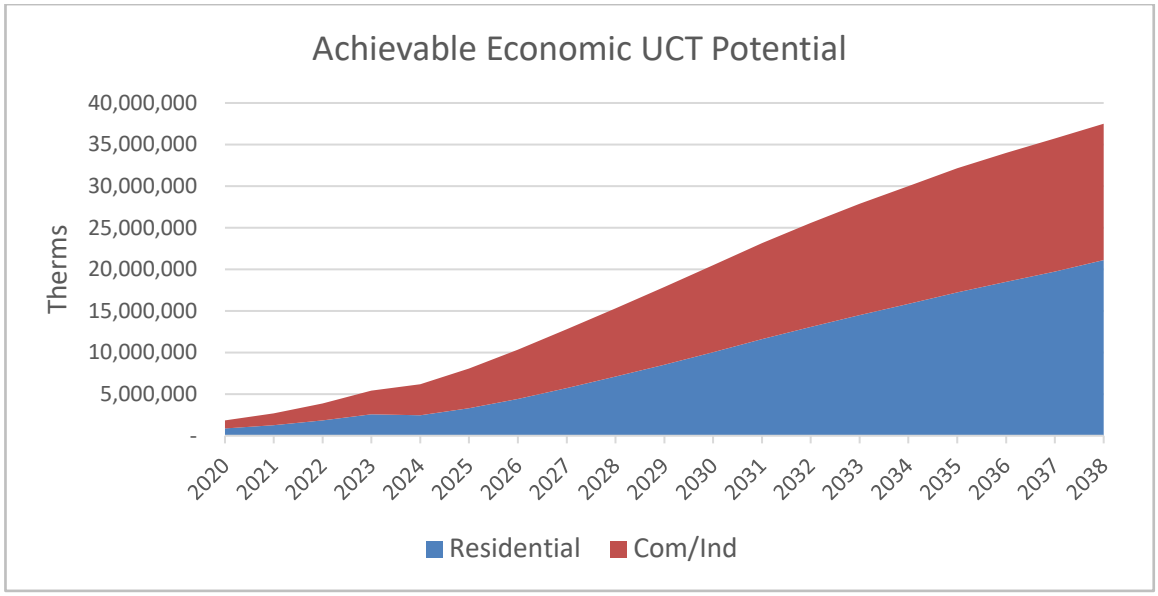


Figure 12 provides cumulative Residential and Commercial/Industrial UCT Achievable Economic Potential.

Figure 12: Cumulative Achievable Economic UCT Potential by Program



4.6.3 Forecasts

A summary of the results of the forecasts are in Table 12, demonstrating the UCT and TRC incremental and cumulative forecasts for Residential, Combined C/I and portfolio total.

Table 12: 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				
2020	338,801	387,824	875,100	968,092	539,557	297,888	1,527,050	772,706	726,625	837,445	1,843,192	2,299,756
2021	383,375	469,878	1,252,621	1,441,071	584,293	356,732	2,097,963	1,132,098	853,253	941,025	2,693,692	3,230,061
2022	584,766	616,689	1,830,069	2,058,945	825,984	468,671	2,907,271	1,600,923	1,201,455	1,294,654	3,889,014	4,508,194
2023	745,914	767,026	2,572,293	2,833,863	1,032,829	584,490	3,926,753	2,190,780	1,512,940	1,617,320	5,406,156	6,117,533
2024	732,266	912,456	2,445,568	3,737,166	1,059,790	697,058	4,134,259	2,879,626	1,644,722	1,756,848	6,182,734	7,013,885
2025	883,657	1,053,296	3,301,450	4,789,193	1,234,243	812,204	5,315,107	3,693,217	1,936,953	2,046,447	8,090,642	9,008,325
2026	1,163,954	1,126,613	4,435,409	5,906,457	1,661,157	863,608	6,910,170	4,549,766	2,290,567	2,524,765	10,341,866	11,459,936
2027	1,316,682	1,164,746	5,732,140	7,079,085	1,832,471	887,603	8,681,422	5,443,787	2,481,428	2,720,075	12,811,225	14,125,209
2028	1,431,836	1,176,357	7,100,297	8,212,712	1,933,448	893,507	10,473,284	6,303,066	2,608,193	2,826,956	15,313,009	16,776,350
2029	1,512,382	1,173,899	8,547,069	9,356,212	1,965,263	888,957	12,282,523	7,173,233	2,686,281	2,854,220	17,903,281	19,455,756
2030	1,573,988	1,149,233	10,057,165	10,437,437	1,923,271	870,618	14,046,662	8,004,525	2,723,221	2,793,889	20,494,601	22,051,186
2031	1,596,752	1,138,764	11,623,472	11,545,593	1,804,766	865,843	15,736,222	8,847,685	2,735,516	2,670,609	23,169,065	24,583,906
2032	1,572,400	1,090,278	13,078,677	12,517,667	1,606,283	826,798	17,106,092	9,577,205	2,662,678	2,433,081	25,596,344	26,683,296
2033	1,534,014	1,035,042	14,505,070	13,397,059	1,372,640	783,447	18,259,155	10,232,606	2,569,057	2,156,088	27,902,129	28,491,760
2034	1,426,467	976,344	15,846,120	14,169,991	804,149	738,442	18,904,551	10,794,586	2,402,811	1,542,591	30,016,111	29,699,137
2035	1,419,557	948,998	17,246,692	14,921,195	593,375	715,317	19,428,791	11,330,841	2,368,555	1,308,692	32,167,887	30,759,632
2036	1,392,975	901,499	18,493,890	15,493,001	418,490	678,880	19,637,203	11,734,193	2,294,474	1,097,370	33,986,891	31,371,396
2037	1,383,751	870,436	19,752,036	15,985,862	281,221	653,316	19,738,731	12,073,136	2,254,187	934,537	35,737,899	31,811,866
2038	1,433,008	810,118	21,115,278	16,392,826	202,273	598,422	19,822,364	12,334,793	2,243,126	800,695	37,508,104	32,157,157

*note: The company is working with AEG for updates to the LoadMAP model to address the savings shelf observed in 2022. These updates will be reflected in the 2021 Conservation Plan and the next iteration of the IRP.

4.7 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.

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 lead to revisions to the Company's 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. Other opportunities for emerging technologies may be found through the Company's engagement with NEEA.

Regional Collaboration

Cascade engages with partners throughout the Pacific Northwest to increase availability of energy efficient appliances, develop industry accepted guidelines for program delivery and leverage efforts to maximize ratepayer value. These efforts currently involve membership in NEEA and some joint utility program messaging. In the coming years the Company will extend its partnerships to include membership in the Regional Technical Forum (RTF), more robust co-branded utility offerings including referrals and potentially training or auditing assistance.

5.1 Regional Technical Forum

For the first time, and at the instigation of the Company, in 2020 the RTF will include natural gas energy studies in their scope of work. Cascade's Washington Natural Gas funding share will mirror NEEA apportionment at 3.11% of $1.8M prorated over five years. The Energy Trust of Oregon has a 22.63% funding share which includes Cascade's Oregon share of natural gas funding. The Council approved the budget workplan in mid-October. RFPs will be issued before end of 2019 and contracts are expected with participating utilities by January 2020. Charter updates, adding natural gas and demand side, were included in the mid-October agenda and the RTF Policy Advisory Committee Charter will be updated in February 2020. The budget rules will allow funding to roll over from year-to-year with a true-up at the end of the five-year period, however, funders will receive a memo report tracking funds on an annual basis. Existing dual fuel measures will be the initial focus for the Natural Gas RTF, expected to include furnaces, tankless water heaters and weatherization. Saving Shape enhancements will be incorporated when new technologies come online, and Demand Response will be a complementary enhancement. Gas-only measures will be in-scope for 2021 – 2024.

5.2 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 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 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."[10] 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 currently available 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 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 transitioning into Cycle 6 in 2020.

NEEA's work moving into Cycle 6 (2020-2024) is planned as follows:

- Condensing Rooftop Units – This program is currently in the Market and Product Assessment Phase of NEEA's initiative lifecycle. The alliance plans to move this product into the next phase of the lifecycle in 2021.
- Efficient Gas Water Heaters – The program is in the Concept and Opportunity Assessment phase of NEEA's initiative lifecycle and is projected to move into the Market and Product Assessment phase in 2020 or 2021.
- Next Step Homes – This dual-fuel program is currently in the Strategy Testing and Finalization phase. The alliance is planning to move this program through the Scale Up Approval milestone in 2020.
- Gas Combination Space and Water Heating (Combi) Systems – The alliance will continue scanning activities in 2020, with several technologies and systems being tested.

The Company was successful last year in obtaining Board level participation within the Collaborative and looks forward to continuing throughout Cycle 6 on the Board of Directors. Cascade's participation on the Board of Directors allows for a more inclusive approach to

[10] NEEA Strategic Plan 2020-24, pg. 2

market transformation from electric only, gas only and dual fuel funders actively engaging alongside representatives from public interest groups, energy service professionals and regulators.

5.3 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 were not used within the cycle NEEA would return the Company's portion of the funding that had 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 portfolio cost-effectiveness. Table 13 shows the pilot's first 5-year cost allocation for Cascade's participation and Cycle 6 (2020-2024's) allocations.

Table 13: NEEA Annual Cost Commitment

Year	CNGC Washington Commitment at 9.3% for Cycle 5 & 9.22% for Cycle 6
2015	$145,872
2016	$244,996
2017	$313,174
2018	$452,285
2019	$548,804
Cycle 5 Total	**$1,705,130**
2020	$348,908
2021	$348,908
2022	$348,908
2023	$348,908
2024	$348,908
Cycle 6 Total	**$1,744,542**

Cascade's participation within the NEEA efforts will continue, with efforts specifically centered on the Natural Gas Advisory Committee (NGAC), the Natural Gas Committee of the Board and the Board of Directors workshops and quarterly meetings. Cascade staff will also engage as needed in subcommittee discussions to leverage the membership.

Individual funding agreements with utilities are in the process of approvals throughout CY 2019. See Appendix A for a snapshot from the 2020-2024 NEEA Business Plan for planned Natural Gas program activities.

5.4 Housing Stock Assessment Review from NEEA

One of the areas CAG stakeholders requested Cascade explore and incorporate into future efforts involves engaging with NEEA more fully through their building stock assessment reports.

The 2020 – 2024 Plan will be the first cycle that gas funding will specifically support the stock assessments.

Regional Building Stock Assessments (Commercial (CBSA) & Residential (RBSA)) characterize the existing building stock to account for regional differences such as climate, building practices and fuel choices. The residential assessment focuses on single family homes. These stock assessments also collect and analyze plug load data to help the region identify opportunities to manage plug load growth and may address "the why" behind the energy trends of building stock and behavioral tendencies of occupants for the residential single-family study. This improves the alliance's ability to understand trends and influence energy efficiency efforts going forward. The commercial stock assessment started in the 2020-2024 Business Plan and will be concluded early in the next business cycle (2025-2029).[11]

During the last iteration of the CBSA NEEA hired an energy consulting and research firm (Cadmus) and its subcontractors (McKinstry, Energy 350, and DNV GL) to conduct the research study.

In May 2018, the CBSA initiated their recruitment, see Table 14. Cascade designed a non-disclosure agreement to accompany the Cadmus online survey and provided energy usage data for 50+ businesses from a random sample selection process. As of Q2 2019, approximately one quarter of the On-Site assessments had been completed.

[11] NEEA 2020-2024 Strategic and Business Plans. (n.d.). Retrieved from https://neea.org/resources/neea-2020-2024-strategic-and-business-plans.

Table 14: NEEA CBSA Recruitment timeline

Task	Month	May		June				July					August				2018	2019
	Week	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	Sept - Dec	Jan - Sept
Finalize Customer Contact Protocols and Materials																		
Identify utility contacts: billing release forms and billing requests																		
Verify desired billing release format and billing data request protocol with individual utilities' designated poc																		
Request/provide billing data																		
Regional Webinar (June 6, September, December, March)																		
Send selected sites to utilities for review for **Pre-test (6 sites)**																		
Utilities review **6 pre-test** sites and respond to Cadmus (Response due 10 days after receipt of list)																		
Cadmus recruits and schedules site visits for **Pre-test**																		
Send selected sites to utilities for review for **full sample**																		
Utilities review sites and respond to Cadmus for **full sample** (Response due August 3)																		
Cadmus reviews lists to determine next recruitment step																		
Recruiting and scheduling begins																		
Conduct On-Site Assessments																		

In addition to the CBSA coordination Cascade provided data for approximately 80 of its customers at the individual property level, per NEEA's request for the last RBSA study.

As of April 4, 2019 issues with water flow measurement and envelope u-value calculations were resolved and updated in both the reports and database.

Additionally, an alternate weighting scheme was developed which should provide better weighting at the sub-regional level. Sample weighting, applied to primary heating and water heating fuel. The new weights resulted in small (1-2%) but persistent shifts towards electricity, wood (home heating only), and propane, and away from natural gas.

The team had originally intended to also include an "urban" vs "rural" indicator explicitly in the post-stratification approach, but this was not possible because of the availability of data to describe this variable for each sample bin (urban/rural designations are only available from the Census Department at the county or census block group level, not service territory or zip-code level, which is necessary for this analysis) and the fact that the sample bins would get too small to analyze, especially given the correlation and interdependent nature of the urban/rural variable with the other two variables: county and utility type.

The research team used a modified version of the RBSA I zip code correspondence file because certain attributes of the RBSA II zip code correspondence file made it more difficult to use for this analysis.

5.5 NEEA Next Step Homes

In late 2018 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 were 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. NEEA met 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 also revisited the program strategy and outreach activities, such as the BetterBuilt NW platform, for natural gas opportunities. Last year the Company and NEEA discussed how Next Step Homes activities and tools could support the Company's residential programs while working towards long-term regional natural gas market transformation. Cascade remains interested in exploring leveraging opportunities and will reengage throughout the winter under the leadership of its new Builder Coordinator with the NEEA new home programs.

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 various mediums but can also use their preferred method to interact with Cascade's programs. 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. For instance, the Company provides messaging for new tariff releases (such as windows) through bill inserts promoting the change, through advertisements illustrating the message, and one-on-one outreach discussing the program updates directly with customers.

The company continues to use traditional and social media sources to communicate with the public, and specifically with customers. Working with its corporate customer communication department, the EE Department has been able to inform customers of upcoming events and accomplishments in real time including energy fairs and large rebate check presentations recognizing customer EE accomplishments.

Customers regularly obtain information and interact with the program through the program's website, www.cngc.com/energy-efficiency, and the Department's dedicated customer service phone line. Other sources of information come from local Trade Ally contactors, staff attended outreach events, social media posts, and its third-party program implementation contractor for the C/I program. Rebate submission and interaction is primarily through the Public User interface (PUI) online application portal, email, mail, or fax.

The Company delivers program messaging using bill inserts, radio ads, events, community engagement and program material placement in external publications. Cascade has recognized increased savings goals require additional outreach and

messaging to key audiences, which means additional funding and attention put toward specialized outreach.

Messaging campaigns continue to include consistent elements for brand awareness and not only focus 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 through Trade Ally interaction and in-house 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. Outreach to areas of low participation require a more local or specific feel to make the message more impactful to that area and demographic. Conversely, a message about a general upgrade appropriate for residential or commercial placement can be widespread. This is readily apparent when the Company evaluates which print media to advertise in, and what message to place.

6.1 Community Participation - A Key to Program Longevity and Support

One area Cascade has found essential to increased program participation and awareness is involvement with local community energy efforts and programs. 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 EE message in new ways to existing audiences.

The company continues to partner with regional non-profits and intends to expand collaboration with neighboring utilities and agencies. The presence of multiple utilities at outreach events has greatly improved customer reception of energy efficient information and program availability. Whether a customer of the Company or another utility, consumers can benefit from information about energy efficient upgrades and rebate availability. The Company will expand on these collaborations and partnerships in 2020 by cosponsoring events, providing a greater general efficiency message that applies to all fuels and territories, and employing on the ground resources that partner agencies may have in HTR markets.

Cascade continues to regularly collaborate with the community energy programs Sustainable Connections (SC) and the Community Energy Challenge (CEC) in Whatcom and Skagit County and the Sustainable Living Center (SLC) in Walla Walla. Regional Community Energy Efficiency Programs (CEEP) such as the CEC and SLC leverage Company funds to assist with delivery of EE program information and pave the way for customers to apply for rebates while working through local energy auditors.

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 from the utility has been 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, offering expert advice, 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 to provide personal interactions with community members to help them qualify and apply for rebates. As the programs evolve, these organizations frequently act as a first introduction to energy efficiency. Often, the community organizations have become a trusted resource that helps 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, thus 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 efficiency increases dramatically.

Cascade has also found value in coordinating with various educational programs from secondary school to university levels. Visiting classes of middle schoolers or graduate students has granted opportunities to inform the next generation of the Company's EE efforts including rebate opportunities, energy saving tips, and clarification of energy efficiency options.

Company staff engages with the Western Washington University (WWU) Institute for Energy Studies. The Company will continue to provide support to sustainability efforts on the campus with information about its EEIP, tabling at events and providing guest lectures on working within a regulatory environment, demand side management and efficiency programs at the university.

Company representatives also continue involvement in WWU's Women in Energy Mentoring Network (WIEMN) which 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, learning real world applications and supporting diversity in both energy studies and the energy industry through support and feedback from professionals.

For the past 5 years, Cascade has 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 educate middle school students about energy generation, production, safety, efficiency and conservation. Participation by Cascade provides a well-rounded perspective of regional energy sources used in the home, the different uses of energy, and in turn, how it can be conserved. It also provides an opportunity to talk with young people about energy consumption and conservation. Company staff intend on continuing to participate in this annual event and explore other K-12 opportunities in 2020.

After the success of Trade Ally partnered radio ads in 2018, the Company is continuing to offer this outreach option as a cooperative marketing tool for interested contractors and is looking to expand to HTR markets, including economically impacted customers in climate zone 2 and potentially multifamily properties. Trade Allies are given annual training and marketing funds from the company to improve customer interest, and through this opportunity they have the option to participate in a series of radio ads jointly promoting the EE programs and the TA's services.

In 2018 the EEIP launched a Point of Sale instant rebate pilot with three participating Trade Allies. The contractors were chosen based on good standing with the program, the service territory they serve and their measure offerings. Two contractors served the Company's Climate Zone 1, an insulation installer and an HVAC specialist, while the third contractor served Zone 3 with heating upgrades. The pilot gave an opportunity to educate and interact more with our Trade Allies resulting in the submission of more straightforward, correctly completed, rebate applications.

These contractors were also allowed a special marketing opportunity to advertise this promotion of instant rebates to customers through radio and social media video ads.

In 2019, the pilot ended, and a Point of Sale instant rebate option was offered to all Trade Allies in good standing. More contractor participation in instant rebates is expected into

2020-2021 due to the awareness about the program of sales staff, the use of instant rebates as sales tools, and the ease of participation for customers.

Expanding on the existing partnerships with District offices, EEIP staff will host informative meetings to educate Company operations staff about the Energy Efficiency and Rebate program. Gaps in awareness about the EEIP internally provides further opportunities for clear understanding and promotion. As these service technicians and staff members interact with the public daily, there's an opening to provide them with information beneficial to customers in real time. If operations staff install new gas lines and simultaneously inform customers of available rebates it helps the customer make informed decisions while improving their customer experience. Conversely, if a furnace is flagged for safety concerns and is decommissioned, the mention of a rebate to offset some of the cost of a new furnace could lessen dissatisfaction. In 2019, a presentation about the EEIP was given to call center employees at a corporate level and one of the district offices. A similar presentation will be given to the other Washington district offices throughout 2020-2021.

The company intends on continuing shared safety and efficiency outreach at service area sporting events such as baseball games in Yakima, Walla Walla, Longview and Bellingham. Along with continuing with these opportunities and adjusting messaging to target underserved audiences in 2020 -2021, the Company will look at other professional sporting outreach options like hockey, roller derby and women's professional sports.

Bill inserts and mailers continue to serve as an effective outreach tool highlighting rebate measures and driving awareness of the program, as avoiding the "I wish I knew that before I bought" regrets have become a focus for the programs. Additionally, Cascade understands a reoccurring rebate reminder arriving monthly with a customer's bill aids program understanding and brings new opportunities to the customer's attention as their needs change throughout the year.

6.2 Residential Focus

Local Home Builders Associations (HBAs) provide another consistent partnership opportunity for energy efficiency messaging. In 2019 EE focused articles and ads were placed in Home Tour directories with the (HBAs) of the Tri-Cities, Central Washington, Whatcom County and Skagit/Island County as well as signage in the gas heated homes on the tour. An EEIP focused video was also sent out on social media to promote the Skagit Home Tour and rebate awareness in general. In 2020-2021, the Company will

continue to participate in Home and Garden shows, regional events, and Home Tours and look for further opportunities to reach the building community.

The booming housing market in portions of the territory puts realtors in the position of being informants to new customers on new home resources. The Company will continue to reach out to Association of Realtor meetings and scan for additional opportunities to increase outreach to realtors into 2020.

The Company relies heavily on coordination with local area contractors to encourage uptake of its conservation programs. It communicates regularly with contractors when questions arise during rebate processing. One on one meetings, similar to those at the district offices, will occur more often in the coming years to ensure program and partnership success. The Trade Ally network also enables the Company to verify and review most installations performed as part of the EEIP. Training and outreach to contractors will continue into 2020-2021 to improve understanding of the EEIP and confirm accurate messaging. The company will continue to offer training funds for contractor improvements such as classes on Blower Door Testing or new manufacturer presentations for energy efficient models and instructions on install requirements for high-efficiency models.

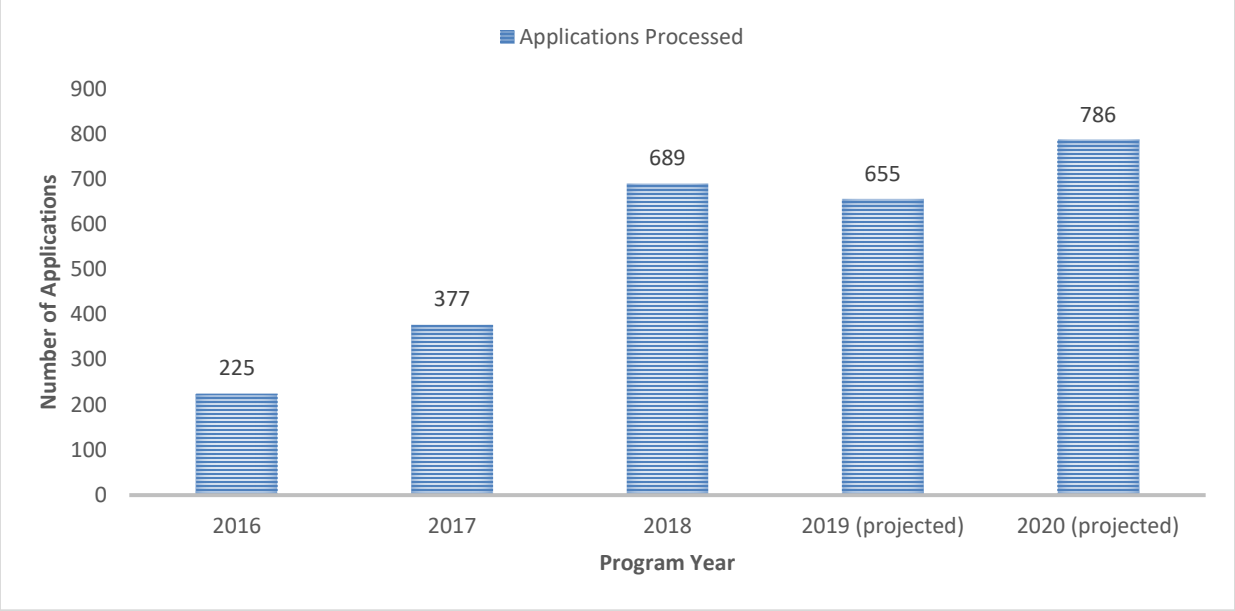
The Trade Ally program offers benefits and advantages to TAs in addition to POS options and training/advertising reimbursements. These include technical support as well as special bonus coupons. The coupons must be submitted by a customer in conjunction with a qualifying rebate application whereupon funds are distributed directly to the customer. These coupons encourage TA's to discuss rebate-able options with customers as opposed to encouraging standard efficiency, lower cost installations. TA's also receive advertising on the company website and referrals as vetted contractors when staff communicates with customers.

6.3 Growing the Builder Cohort

The Builder Program experienced two significant changes that affected performance in 2019. Early in the year, deemed therm savings were decreased by roughly 13% per measure from the reassessment of deemed savings from the CPA. As a result, 2019 processed therms are projected to fall short of 2018 numbers by 18,500 therms. Moreover, the mantle of builder program coordinator passed from the program's initial coordinator to a new team member causing a disruption as there was a decrease in direct outreach during the transitionary period. See Figure 13 for new home applications

for 2016-2018 (actuals) and 2019-2020 (projected).

Figure 13: Builder Program 2016-2020



6.3.1 2020 Outlook

Builder Program homesite levels grew at a 65% year-over-year growth rate in the years preceding 2019. The expected growth rate for 2019 was 30%; however, with the transitions taking place the program experienced a small decrease of 5%. The growth of the builder program is likely to follow a more linear growth pattern in the forthcoming years with an estimated 15-20% growth for 2020. This trend is likely because:

- Many of the largest builders have already been brought into the program and require less assistance to continue participation
- While the additional outreach required to bring in smaller builders, who make up the bulk of untapped potential in CNGC territory is worthwhile, on an individual basis it will provide less new homesites resulting in diminishing returns
- Builders are more frequently electrifying water heating loads and installing electric Heat Pump Water Heaters in absence of a market ready natural gas alternative
- 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

Despite these factors, CNGC expects growth will continue for 2020 homesites and therm

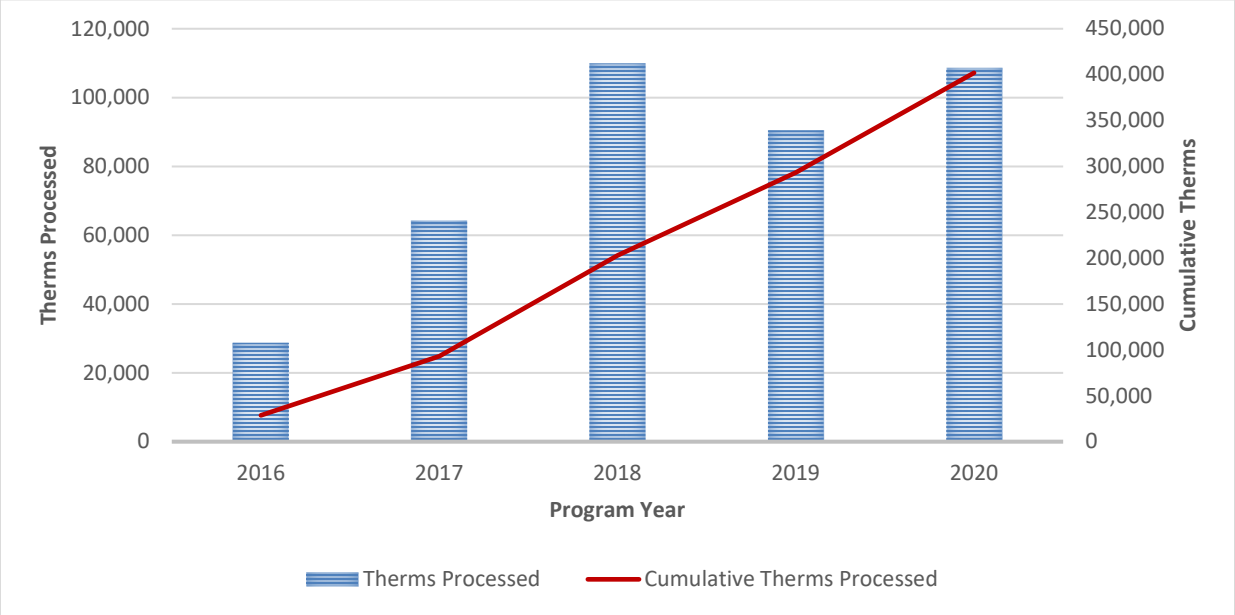
savings. During 2017 to mid-2018, the program allocated approximately 20% of a full time equivalent (FTE) staff's time toward focusing on the Builder program. Staffing increases in Q3 2018 have enabled this to shift to approximately 33% with an end goal of reaching 50% FTE in 2019, with a slight delay due to the transition of builder program coordinators, resulting in the schedule for increasing to 50% FTE pushed to 2020.

The Company believes growth is still possible considering the robust new homes market in some of its territory and will utilize the additional 2020 Builder focused hours in several key areas:

- Continued, expanded efforts in more direct one-on-one outreach with builders; provide training in one-on-one settings so builders can streamline their application process
- 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
- Identify more Built Green and ENERGY STAR certifiers to facilitate greater uptake in areas where program participation has historically remained low due to a lack of available verifiers
- 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 Homes program seeking synergies and opportunities to leverage regional efforts.

See Figure 14 for Projected Builder Program therm savings moving into 2020.

Figure 14: Builder Program Therm Savings 2016-2020



6.4 Low Income messaging opportunities

Cascade was active in joint messaging with its agencies in 2019. A budget of $20,000 was provided by Cascade for outreach to the community to generate greater awareness of, and participation in, the Weatherization Assistance Program. Multiple agencies took Cascade up on its offer of program promotion, including Benton Franklin Community Action Committee, Blue Mountain Action Council, Kitsap Community Resources, the Opportunity Council; and the Housing Authority of Skagit County. Cascade followed the agencies' leads, shaping messaging and medium by the needs of the community. Examples of outreach activities included radio messaging, as well as the creation of sandwich-board signs promoting weatherization for display in front of homes while work is completed. Cascade also promoted weatherization for two of its agencies via ads on the Company's Facebook page.

The Company believes its efforts with the agencies have been successful and continues to seek opportunities for additional messaging to customers to encourage program participation.

6.5 Commercial Focus

Alongside the residential outreach efforts, Cascade also promotes messaging to Commercial and Industrial customers. In the last quarter of 2019, Cascade opted to have the C/I outreach team develop a few commercial focused inserts for widespread delivery allowing for a sector appropriate message. The C/I team has insight into what measures are lagging and can develop an insert with that as the primary focus. Historically bill inserts have focused on the residential program and the Low-Income programs and are now addressing all eligible customer classes.

Additionally, the Company continues 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.

Cascade also attends 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 as opportunities arise.

LM Energy, the company's C/I program implementation vendor, plans to take a deeper look at historical participation data to identify regions with low participation. Based on that data, LM Energy will select one or two cities to focus on in the coming two years. The C/I team then plans to work with Cascade to develop a TA strategy to recruit new contractors in those underserved areas, send targeted mailers to promote program awareness and host energy-efficiency workshops to educate participants and contractors. These workshops will engage with customers as a mechanism to involve property owners, managers and maintenance staff in areas with low participation with the goal of driving savings and expanding program awareness. These events support the program's overall customer account management approach and engagement strategy by encouraging new and existing customers to take action at their properties. In addition to educating customers on program offerings, these events provide an opportunity for the program to listen and learn from customers to better understand their unique challenges and participation barriers—insight that is crucial to future program design and delivery. The team can duplicate a similar event for contractors and trade allies in the identified areas.

The C/I team also plans to use direct mail as another form of outreach. Targeted and periodic mail helps spread program awareness to historically HTR regions. Marketing

efforts will include direct mail throughout the year to increase awareness and drive savings with targeted regions. The team will send program offerings, case studies and perhaps a bonus opportunity to the identified areas to increase project count.

6.6 Online

In 2019, Cascade kicked off the year with the retirement of the Conservation Corner microsite to better align with branding with its Parent Company, MDU Resources. Instead of customers seeking out a separate site to retrieve the incentive information, they can now pay their bill and apply for a rebate on the same site. Searchability by keyword is much easier as is re-direction to the Energy Efficiency pages. The department has worked to improve the clarity around offerings available to Oregon customers through the Energy Trust of Oregon and those available to Washington customers through the Company's self-delivered programs. When clicking on rebate information, Oregon customers appear first with a clear path to where they need to go. Washington customers then scroll once to find the desired information. Since the migration, the Company has not received calls from Oregon customers having trouble on the Cascade website, although C/I customers have found it difficult to readily view available rebates because of the need to scroll. Due to feedback of this nature, Cascade actively documents customer feedback and implements more user-friendly recommendations through coordination with its Customer Communications Department.

One of the key benefits in transitioning to the new site involved improved mobile compatibility, although the program is tracking desktop users visiting the EE pages at more than three times the number of mobile users. For example, March through April tracked 7,339 desktop users to 1,984 via mobile, which signals future opportunities to streamline and improve for mobile users. This allows customers and TAs increased access to energy solutions from the palm of their hand and out in the field, granting even wider access to CNGC services. The C/I team will capitalize on this opportunity in 2020 and drive traffic to the website with planned campaigns.

To date, there have been a total of 11,657-page views to the following C/I pages: ESK Application, C/I Application, Commercial Rebate landing, and CNGC EE landing page. Figure 15 illustrates the 2019 YTD Unique pageviews for C/I customers. February had the most unique page views with 109 visitors to the Commercial Rebate landing page, 31 visitors to the C/I Application and 23 visitors to the ESK page.

Figure 15: 2019 C/I Page Views

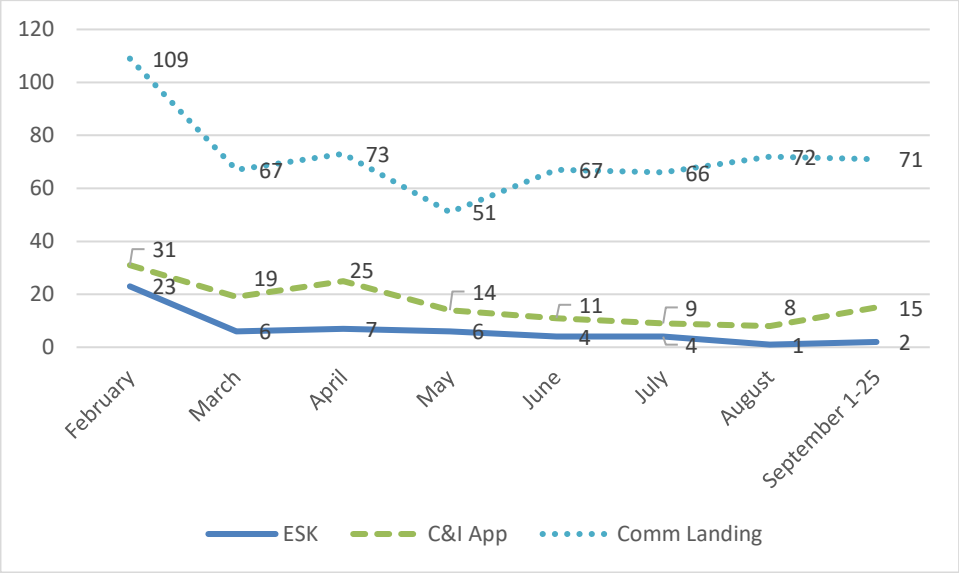


Figure 16 illustrates page views to 2018 web pages.

Figure 16: 2018 C/I Page Views

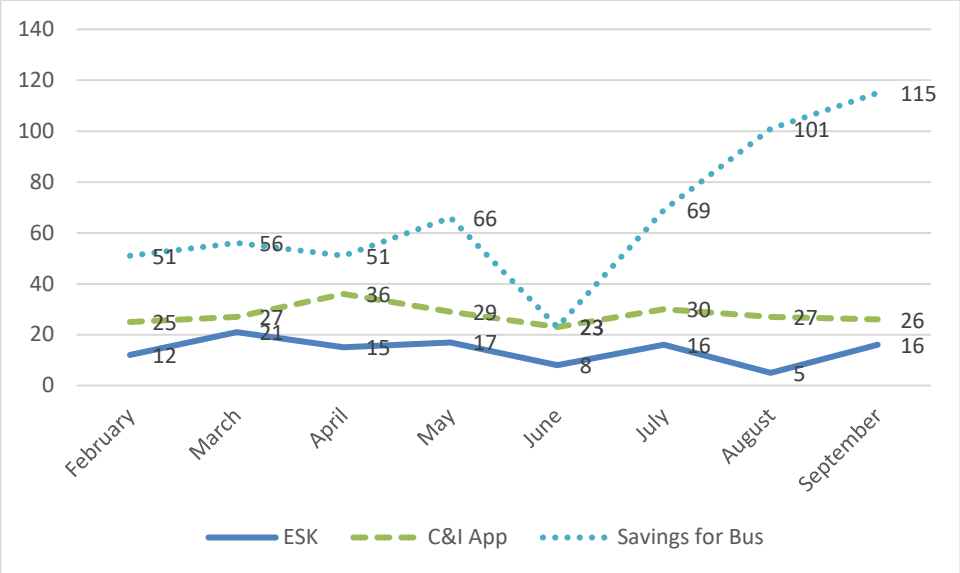
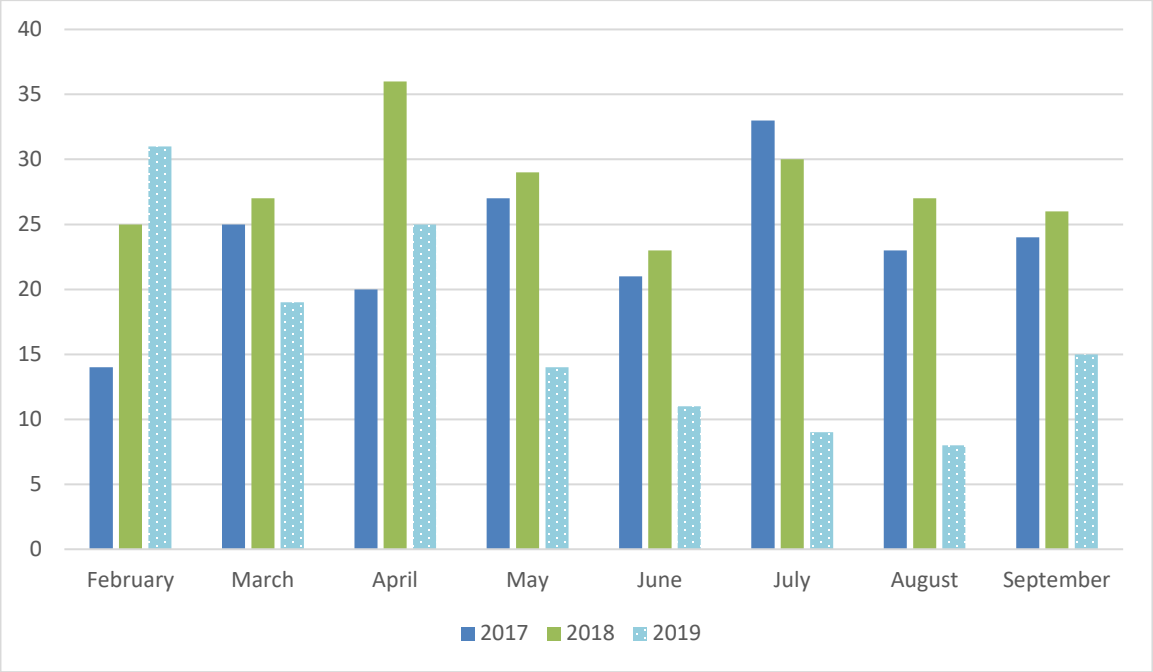


Figure 16 highlights the monthly comparison of unique visitors to the C/I Application for 2018, while Figure 17 highlights monthly from 2017-2019.

Figure 17: C/I Application Page



The C/I vendor will work alongside the Company's team in 2020-2021 to implement new ideas to the website, including paid advertising campaigns, to drive website traffic and provide customers with even more efficiency information. This includes a paid Google AdWords campaign to bring customers to the new web pages.

Recommendations include:

1. Create a one-stop-shop Commercial rebate landing page
2. Develop technology-specific rebate pages within the Commercial rebate landing page
3. Add success stories to the rebate pages

6.7 Customer Calls

Throughout the day, Cascade tracks each outgoing and incoming call for analysis to improve program interest by understanding the customer's experience. This analysis consists of:

- Pre-Purchase calls: Advice on how to qualify for a rebate, prior to purchase and install
- Pre-Application: Question on whether existing equipment qualifies, or about filling out and submitting an application
- Status: status update on rebate application

- Transfer: transferring to correct department ex: Energy Trust of Oregon, CNGC call center, LM Energy C/I program assistance
- Follow-up: outgoing calls for missing information and miscellaneous inquiries

After a new trend was identified, a tracking mechanism was implemented in the call log for calls driven by mailed bill inserts. Although the department is delighted to see interest generated from its inserts, a spike in calls can be indicative of an issue with how the program is delivering its message. Cascade strives to track the content of these calls to better improve the language on the insert, making sure customers get the information necessary to answer their initial questions and then direct online to apply or review a list of qualifications.

The majority of outgoing calls consist of missing information from application submittals, also known as follow-ups. Cascade has learned to look at the application process through the applicant's perspective to streamline processing. By taking a step back, the department can review ways to communicate documentation needs to support swift rebate processing. One situation noted during analysis indicated a need for insulation contractors to more consistently include square footage and beginning/ending R-Values. Because of this oversight the program is developing a stamp for insulation Trade Allies to use on their invoices. The stamp is intended to cut down on admin time for processing, resulting in lower status calls from customers, and less touches to the TA for revised invoices.

The EE department also plans to take a strategic look at process improvements for rebate entry to cut back on status calls. In the beginning of 2018, Cascade began an application entry pilot, that consisted of flagging clean applications for common measures such as furnaces, tankless water heaters, and insulation. These applications were 'fast tracked", with a high confidence that they would be processed more rapidly because they were complete upon submission. Flagged applications with missing information are then delegated to one person, who works with the contractor or customer to track down the necessary information.

See Figures 18 and 19 for a six-month comparison for 2018 and 2019's incoming and outgoing calls. Call volumes tend to be higher in the winter months and taper off in the warmer months aligning with the seasonality of natural gas as a heating fuel. With communication improvements through outreach, providing tools to contractors to reduce missing information, and creating enhancements for quicker rebate entry, the next two years should experience a decrease in total calls per month.

Figure 18: Residential Incoming and Outgoing calls Combined

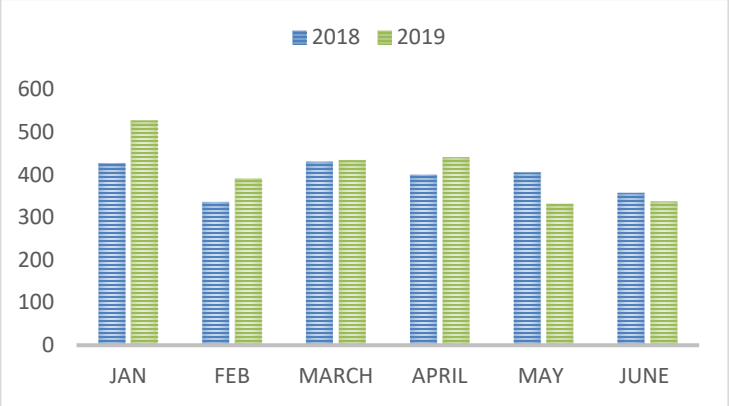
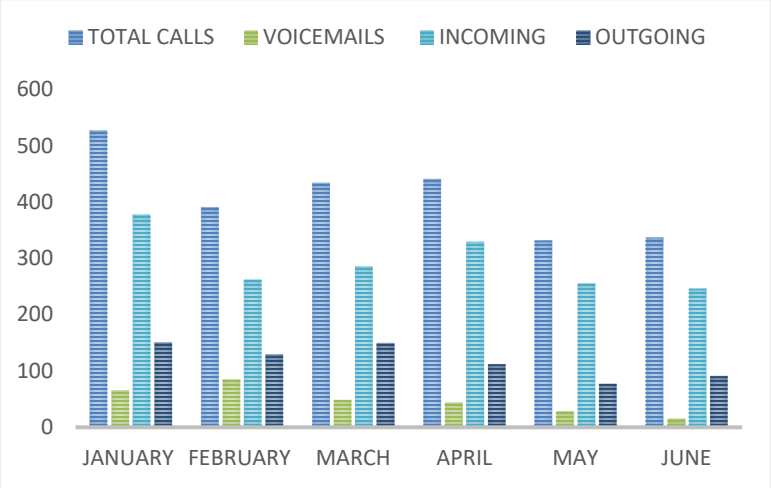


Figure 19: January – June 2019 EE Call Traffic

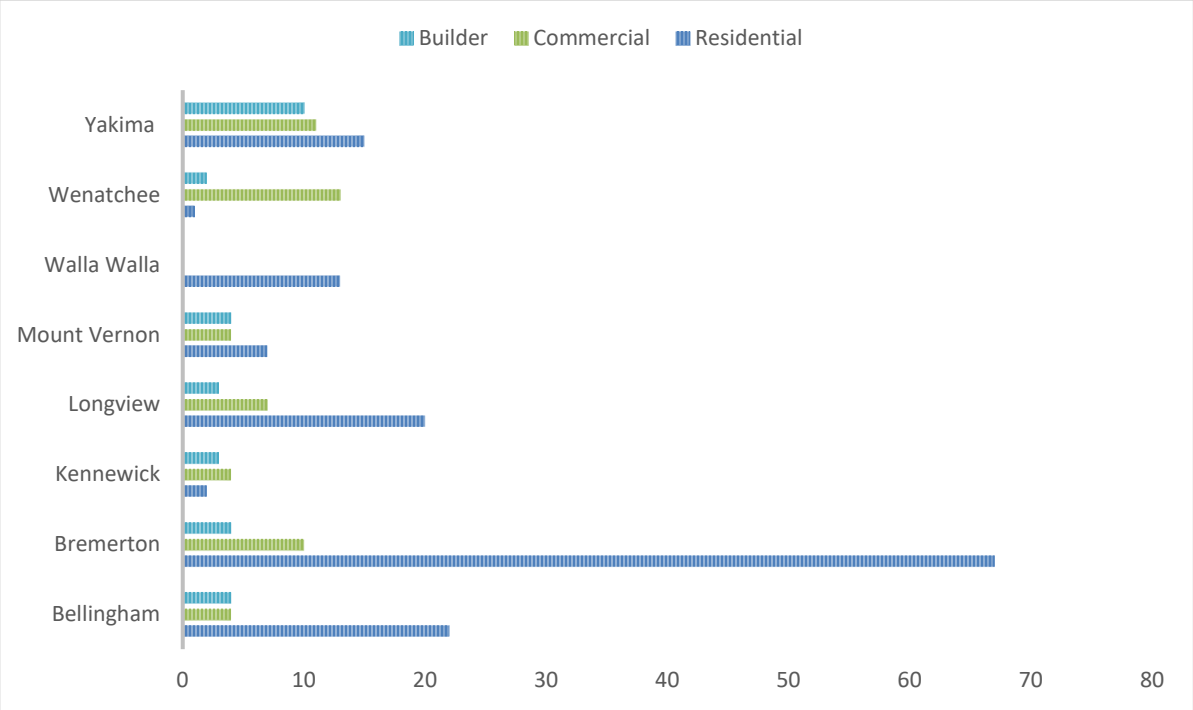


6.8 Feasibility Work Books

Cascade's Energy Efficiency team recognizes a need to provide energy efficiency recommendations and suggestions to customers before purchasing decisions have been made. While standard messaging occurs through the outreach campaigns many potential customers are unfamiliar with available incentive programs. The EE department started coordinating with the Regional Directors two years ago to determine the most effective way to reach these new customers in time to influence buying decisions. The Feasibility Work Book (FWB) process allows the Energy Efficiency department insight into new WA customers, whether through new construction or conversions to natural gas. While out in the field, Energy Service Representatives (ESR) provide customers with the opportunity to learn about energy efficiency while they're still in the decision-making process on equipment types. These customers then fall into three categories as

either a Residential customer, Builder, or Commercial/Industrial customer. If the customer indicates interest in learning about efficiency opportunities through Cascade, the EE department will reach out to the customer directly. Figure 20 displays the participation in the FWB process seen throughout all 3 zones for the first half of 2019.

Figure 20: January – June 2019 FWB Tracking by District



The primary focus of the EE process is to help the WA C/I program reach its goals and encourage customers to put in high-efficiency measures before the opportunity has passed. CY 2018 was a successful year with the FWB process providing the C/I team thirteen strong leads interested in EE. During the first year the EE program coordinated on the FWB process with a total of 56 builders, 82 commercial, and 567 residential customers indicating an interest in energy efficiency. See Figures 21 and 22 for an activity by quarter for 2018 & a comparison between 2018 and 2019 year to date.

Figure 21: 2018 FWB Activity by Quarter

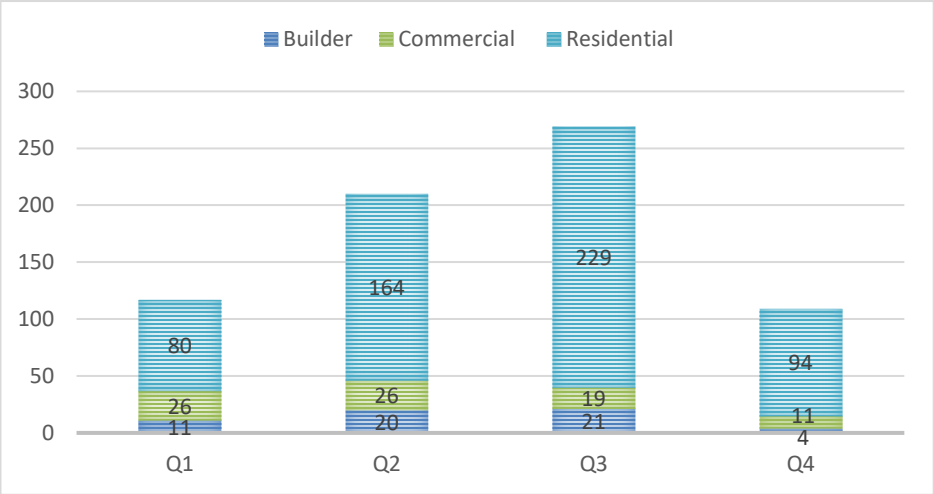
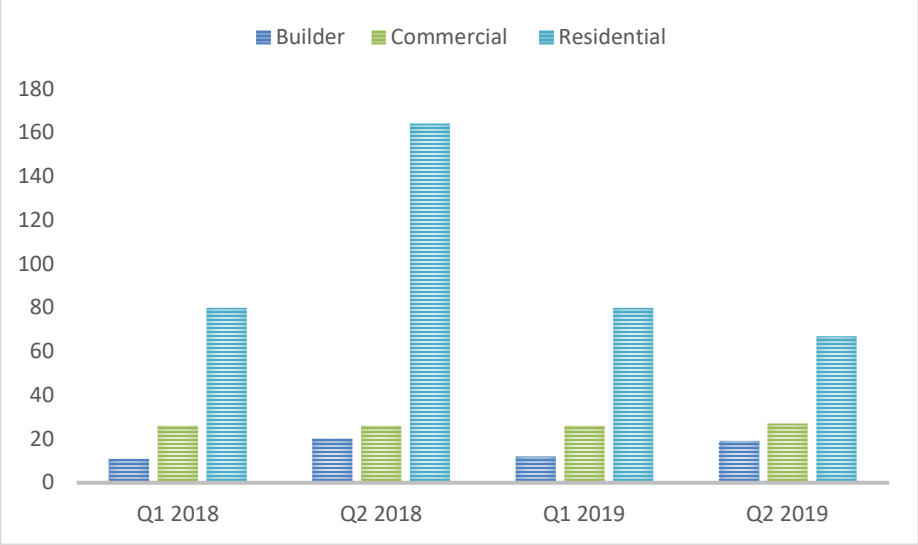


Figure 22: 2018 and 2019 Comparison by Rate Schedule



Cascade plans to work with the ESRs to develop a closer relationship to better understand what each department needs to streamline the FWB process, as well as implement new procedures to expedite receipt of the FWBs. As of now, each FWB is an individual email requiring extensive time to process. Ideally, the process will eventually be a simple report received daily to cut down on processing and allow the customer to receive rebate information in a more timely manner.