CASCADE NATURAL GAS CORPORATION®

A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

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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
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
GEP- Global Energy Partners, LLC
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
LoadMAP- Load Management Analysis and Planning
MDUG- Montana Dakota Utilities Group
MOU- Memorandum of Understanding
NEEA- Northwest Energy Efficiency Alliance
NEI- Non-Energy Impacts
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
PUX- Public User Experience
QC- Quality Control
RBSA- Residential Building Stock Assessment
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
SWAG- Statewide Advisory Group
TA- Trade Ally
TE- Thermal Efficiency
TRC- Total Resource Cost
TREAT- Targeted Residential Energy Analysis Tool
UEF- Uniform Energy Factor
UCT- Utility Cost Test
WACC- Weighted Average Cost of Capital
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) develops 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 use through its Energy Efficiency (EE) Programs.

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

EE within the IRP:

- An executive summary of the forecasting potential for the Company's EE efforts, under a 20-year horizon
- Reference to the 2020 Cascade Natural Gas Corporation Conservation Potential Assessment (CPA) Phase 1, performed by Applied Energy Group (AEG)
- Incorporation of the Company's EE efforts as a resource toward meeting future demand
- Discussions on environmental externalities, regional and local energy planning and legislative impacts and responses from Cascade

Conservation Plan:

- Focuses on potential and near-term conservation program planning
- On the ground program implementation updates
- Regional efforts to improve market transformation
- Scenarios for annual forecasting through the Company's potential forecasting tool
- Outreach plans and community engagement
- Real-time program updates

The Conservation Plan discusses savings potential for the Company's Washington (WA) 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 annual document demonstrates the Company's immediate (two year) conservation goals as well as the 10-year forecast of savings. Future Conservation Plans will be submitted biennially beginning in fall 2021.

The 2020 Calendar Year is requiring the Company's Energy Efficiency Incentive Programs (EEIP) to fully embrace adaptive, real-time management to maintain program momentum and increase customer support amid an unprecedented pandemic. Economic

repercussions from COVID-19's impacts have yet to be fully realized, however they will have a significant effect on trends throughout 2021. Contrary to initial assumptions the Residential program intake did not lag as anticipated despite new construction (not considered an essential business) halting in WA for three months. Program staff encountered residential customers spending more time focusing on home improvements and natural gas upgrades to increase comfort while isolating. Additionally staff took a careful look at program requirements and potential hurdles to approvals and pivoted to accommodate customers if qualifying upgrades were installed.

Although the Residential program submissions remained robust, the Company's Trade Ally (TA) network and associated TA staffing were heavily impacted by layoffs due to increased safety requirements. Additionally, the Commercial/Industrial (C/I) program fell behind on the monthly goals due to business closures, to transition to all remote contacts and companies focusing more on keeping afloat, and less on improvements and infrastructure investments. As Cascade plans for 2021 the Company will continue to closely monitor residential customer feedback, contractor business considerations and further focus outreach on social media and virtual connections until an in-person model can be safely reestablished.

The new year offers an opening to explore alternative ways to connect with customers through technology and shared experiences. In the post-Covid-19 realm cost conscious decisions will drive the majority of customer upgrades and installs and the Company will focus on what best fits customer needs to accomplish its savings goals. Cascade's new mid-stream C/I program will also help promote high-efficiency water heater availability higher up the decision-making chain to increase program participation. The company must also continue to monitor local community discussions around reduction of natural gas use through citywide Climate Action initiatives, such as the City of Bellingham's Climate Action Plan. It will share information regarding energy consumption and EE incentives to support community engagement and help encourage efficient natural gas appliance and envelope upgrades. The Company is committed to finding more ways to work jointly with its communities to minimize natural gas consumption through energy efficiency. Cascade is also exploring options available through WA House Bill 1257, including carbon offsets and biogas initiatives.

1.1 Overview

DSM 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 from energy-efficiency

upgrades. The WA 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 insulation, higher efficiency natural gas appliances, insulated doors, ventilation heat recovery systems and various other Residential and C/I equipment upgrades. By prompting rate payers to reduce their individual demand for gas, Cascade can replace 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 it is the consumer's choice to manage energy use and the DSM efforts help influence those decisions. 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, 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 2021 & 2022

	Calendar Year 2021				Calendar Year 2022			
	Residential	C/I	Low Income	Total	Residential	C/I	Low Income	Total
Admin Budget[1]	$1,066,042	$1,436,858	$59,900[3]	$2,562,800	$1,110,764	$1,494,332	$61,697	$2,666,793
Therm Targets[2]	471,164	578,483	12,180	1,061,827	504,604	509,641	13,000	1,027,245
NEEA Natural Gas Market Transformation				$127,663				$183,025
Regional Technical Forum				$31,400				$31,400
Conservation Potential Assessment				$98,386				

[1] *Budgets in this table are estimates and refer to administrative costs for program implementation, not rebates*
[2] *Therm targets have been developed through LoadMAP. 2022's Biennial Conservation Plan will revise CY 2022 targets*
[3] *Represents Cascade staff & outreach associated with Low-income program delivery not part of payments to agencies*

1.3 Performance Comparison

Table 2 notes Company therm savings achievements biennially compared to the IRP goals for 2012, 2014, 2016, and 2018. Official totals for 2020 will not be available until the annual report is filed in June 2021, but as of early October the combined Residential and C/I portfolio are tracking toward a total annual savings of 677,543 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 2021-2022 biennium targets aim to boost energy savings proportionately higher, by 45%, independent of historic achievements. However, the 2020 IRP projections will likely be affected by unknown economic circumstances due to the COVID-19 pandemic.

Table 2: Recent IRP Goal to Actual Therm Accomplishments

Years	BIENNIUM	GOALS	ACTUALS	DIFFERENCE	GROWTH
2013	**2012 IRP**	1,076,661	1,113,046	**3%**	**-9%**
2014					
2015	**2014 IRP**	1,496,969[1]	1,213,591	**-19%**	**9%**
2016					
2017	**2016 IRP**	1,456,143	1,324,030	**-9%**	**9%**
2018					
2019	**2018 IRP**	1,419,636	**1,463,165[2]**	**3%**	***11%***
2020					
2021	**2020 IRP**	2,063,892	**TBD**	**TBD**	***45%***
2022					

[1] 2014 IRP goals were not acknowledged by the WUTC
[2] 2020's final actuals are not yet available, however 2020 is tracking at 677,543 therms based on the year to date figures through the end of September, and then extrapolated to provide year end totals. This does not represent official achievements for the 2019-2020 biennium.

1.4 Budgeting Parameters

The Company provides the 2021 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 2020's budget.

Table 3: Program Budgets

Program Budgets - Reflected in the 2021 CNGC Conservation Plan			
Incentive Estimates			
Program	**Budget**	**Allocated as DBtC**	**Notes**
Residential	$2,897,659	√	See Residential section
Commercial/Industrial	$1,961,057	√	See Com/Ind section
Low Income	$840,000	√	See Low Income section
Total Incentives	**$5,698,716**		
Non-Incentive/CNGC Program Implementation Expenses			
Program	**Budget**		**Notes**
Residential	$1,066,042		Staffing, software, marketing
Commercial/Industrial	$1,436,858		Third party program mgmt. & marketing, CNGC support & coordination
Low Income	$59,900		Staffing, Marketing, training, supplies
Portfolio Admin Total	**$2,562,800**		Residential, Com/Ind, & LI Weatherization
Portfolio Admin Expenses Breakout:	**Budget**	**Notes**	
Labor	*$732,964*	Company staff allocated 70% residential/ 30% Commercial/ Industrial, Low-Income hours & part time cyclical temporary assistance for processing	
Third Party Commercial/ Industrial Program Mgmt.	*$1,228,225*	Implementation, outreach for C/I EEIP, total for contractor coordination is dependent on vendor goal achievement	
Annual Software fees	*$236,648*	Residential & Low-Income rebate processing, data management, eM&V, TA program, Care Package & tariff update support, virtual inspections, etc.	

Table 3 – Program Budgets continued on next page.

Outreach / Trade Ally / Quality Control	*$317,300*	**Breakdown**	**Allocated as DBtC**	**Notes**
		$20,000	√	LI Weatherization outreach
		$68,800	√	Bonus coupons delivered by TAs to customers & In Person Quality Inspections
		$5,500	√	Residential program partnership with local community energy programs partnerships
		$3,000	√	Local Commercial program partnerships
		$4,000	√	Customer Service Resolution
		$126,200		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	*$47,664*	$4,275		Miscellaneous & general operating expenses
		$23,044		Travel
		$11,830		Professional development
		$8,515		Office supplies
Portfolio Admin Total (Included from above)	**$2,562,800**	Non-Incentive/Admin Expenses		
Total Incentives	**$5,698,716**			
Regional Collaboration	**$159,063**	NEEA & RTF (excluded from DBtC)		
Conservation Potential Assessment	**$98,386**	AEG CPA & Low-Income Market Segment Addendum (excluded from DBtC)		
Total Program Expense	**$8,518,965**	Program Delivery & Incentives & NEEA & RTF		

The EEIP also has a large Commercial custom project slotted to complete during the winter of 2020/2021. At this point it's not clear in which year the oxidizer project will be completed so it is not included in Table 3. If final paperwork is processed in 2021 it will account for approximately $600,000 in C/I rebates, will increase the Pay-per-performance admin estimate for the C/I program and result in nearly 500,000 therms of savings.

Cascade sets an administrative budget to plan and operate programs under the Avoided Costs shown in Appendix H of the most recently acknowledged IRP. This budget must ensure an acceptable ratio of costs balanced with therm savings achievements. Since therm savings offset the costs of administrative investment, the greater the achievement,

the more cost-effective the programs. If the budget or therm savings upon which the portfolio is built are unrealistic, the Company risks developing a scale-dependent portfolio unable to maintain cost effectiveness.

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. Should the programs meet goals for 2020, the portfolio budget has adequate room to support administrative expenses for activities that do not tie directly to therm savings themselves, but rather support program uptake. This buffer allows the Company to increase incentives (where cost effective), add measures to the bonus bundles, offer a furnace filter promotion, increase outreach and potentially accommodate additional staffing to support higher goal acquisition.

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, Avoided Costs and economic impacts to the EEIP's budget.

Additionally, Cascade recognizes WUTC staff have directed the Company to achieve its targets and it will make every effort to meet the goals, as noted in this 2021 Conservation Plan. Additionally, in light of the ambiguous economic nature of the upcoming year the Company will work with its advisory group and its CPA vendor on types of scenarios and inputs to consider in light of COVID-19 impacts to savings achievements.

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.

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 TAs. Based on this guidance Cascade program expenses are broken into

the following categories in Table 4:

Table 4: Direct Benefit to Customer Expenses

Cascade Natural Gas – 2021 DBtC Category Clarifications		
	Direct Benefit	**Program Delivery (Not included in DBtC)**
Residential	✓ Rebate payments ✓ Bonus coupons to customers for using qualified Trade Allies (TAs) ✓ QC 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 ✓ Industry appropriate 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 ✓ Industry specific Trade organization dues ✓ Travel expenses for program delivery ✓ Seminar and training attendance ✓ Miscellaneous operating expenses
Low income	✓ Rebates for weatherization ✓ Agency customer outreach	✓ CNGC labor for program administration ✓ Travel expenses for program delivery

The Company will aim for a minimum 60/40 DBtC ratio in 2021. At this point per the budgets and goals the DBtC could potentially reach 70/30, see Table 5. While the last few years have supported the desired ratio of direct benefits compared to costs there are certain elements of Cascade's territory which make a minimum 60% ratio of benefits to costs difficult to maintain, especially in light of the economic impacts from COVID-19. The Company will explore tracking this measure as a biennial metric as part of the Conservation Plan structure with its CAG starting in 2022.

- The customer rebate budgets are estimates, highly dependent on customer uptake and individual decisions from the consumer. The Company can encourage participation but cannot force customers to engage in the efficiency efforts.
- The programs have specific fixed costs associated with administering incentives to customers. These costs are static and are not affected by the amount of uptake or rebate submissions.

- The CNGC territory is primarily rural and spread out requiring increased administrative effort and funds (lacking other's economies of scale) to significantly impact the full territory.
- The Company is not a dual fuel provider so does not have the same opportunity to leverage existing programs.

Table 5: 2020 DBtC

DBtC - Cascade Natural Gas 2021 Conservation Budget			
	Direct Benefit to Customers	Other Costs	Total Utility Costs
Residential	$2,975,959	$987,742	$3,963,701
Non-residential	$1,964,057	$1,433,858	$3,397,915
Low income	$860,000	$39,900	$899,900
Total			**$8,261,516**
Portfolio Ratio	**70%**	**30%**	
NEEA / RTF			**$159,063**
CPA			**$98,386**

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

Long-term program success requires a commitment to support and advance the Company's EE programs. In this context, Cascade notes the following actions it will take, keeping in mind some are driven from legislative requirements and others are part of operating ever evolving programs. These have also been noted in the *Cascade Natural Gas Corporation 2020 Integrated Resource Plan*[1]:

Adherence to the WA Clean Buildings Act, HB-1257[2], is a key proponent of the EEIP two-year action plan. While a variety of the elements of the bill pertain to energy-efficiency programs the company will focus on the following:

- Implementation and completion of Phase 2 of the CPA with WUTC filing by early Summer 2021
    - This allows for a complete review of measure assumptions, market availability and ramp rates per the Northwest Power and Conservation Council's (NWPCC) Seventh Power Plan
    - It will also include a Low-Income specific market segment review to better determine energy-efficiency potential among income-qualifying customers

[1] Cascade Natural Gas Corporation 2020 Integrated Resources Plan
[2] https://app.leg.wa.gov/billsummary?BillNumber=1257&Chamber=House&Year=2019

- Provide an updated reality check to the goals set for 2021 through Phase 1 of the CPA

- Revise the Conservation Plan development timeline from annual to biennial beginning in fall of 2021 and meet all requirements associated with the biennial plan development
- Meet WA Clean Buildings requirements for early adopters (applies to Commercial property owners of 50,000 square feet or more buildings) including baseline data submission and review through ENERGY STAR®'s Portfolio Manager

In addition, the program will focus on the following areas to increase program uptake in alignment with the higher goals set through LoadMAP:

- Evaluate the progress, and potentially expand, the C/I Mid-Stream pilot for tankless water heaters
- Research both Multi-family offerings to target the sector within Cascade's territories for specialized building upgrades and alternative no cost-low cost options to the existing Energy Savings Kits (ESK)
- Continue to leverage partnerships such as Northwest Energy Efficiency Alliance (NEEA) and Gas Technology Institute (GTI) to incorporate new technologies as they become viable

Not to be understated, Calendar Year 2021 will require consistent adaptive management of the programs based on COVID-19 impacts. Some of the elements of this management will include:

- Exploration of assumptions with the CAG to run alternative potential scenarios through LoadMAP
- Efforts to target C/I customers based on their economic impact, closures and renovation opportunities
- Exploration of efficiency opportunities associated with improvements to air quality in buildings
- Implementation of remote quality inspection processes to initially replace in-person inspections, and eventually transition to a complementary offering with potential to offer light audit review to customers prior to measure installs

1.7 2018 & 2020/2021 Applied Energy Group CPAs

AEG worked with the Company and its CAG throughout the 2017 heating season to provide a service territory specific CPA and dynamic modeling tool utilizing the NWPCC's methodology to determine the Company's various levels of potential by 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[3].

In response to HB-1257's guidance Cascade contracted again with AEG in mid-2020 to update the 2018 CPA through a two phased approach, which will culminate in Cascade filing a revised CPA to the Commission in early summer 2021. AEG was contracted to fully update the current Cascade CPA models, leveraging the analysis framework and AEG's familiarity with data developed during the previous study to support filing this Conservation Plan, the 2022-2023 Biennial Conservation Plan and the current IRP.

The prime requirements for AEG include:

- Conducting a natural gas CPA to identify all available and cost-effective potential to satisfy requirements of RCW 8028.380, adapting the methodology in the NWPCC's most recent Power Plan
- Adapt the methodology utilized in NWPCCs 2021 Power Plan (2021 Electric Plan) for use in natural gas EE planning
- Customize 2021 Electric Pan ramp rates for use in a natural gas CPA by reviewing historic Cascade program accomplishments
- Conduct research into non-energy impacts (NEIs) utilized in other jurisdictions and collaborate with Cascade staff to develop proxy benefits for use in an EE sensitivity analysis

In the first phase of the CPA AEG updated Cascade's models to the latest version of LoadMAP, made updates to key aspects of the 2017 CPA model inputs, re-based to

[3] Cascade Natural Gas Corporation 2018 Integrated Resources Plan (UG-171186) CPA, Appendix H, page i

2019 actuals, revisited the main drivers of potential like participation rates in the context of gas programs, and laid the groundwork for Phase 2 to minimize overlap. In the second phase AEG will refresh the remaining assumptions from the original CPA, assess the energy savings impacts of new measures in Cascade's three climate zones, and incorporate NEIs even when difficult to quantify or monetize.

AEG previously estimated EE potential based on average customer profiles without differentiation by household income. Although this approach inherently captured energy-efficiency potential in low-income homes Cascade is seeking ways to better serve the at-needs community. For this update Cascade asked AEG to provide a focused assessment of the Low-Income Potential to explicitly characterize measures and estimate potential specific to Cascade's low-income customer segment, which will inform future LI program updates.

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. Looking forward, and taking into consideration natural gas futures and a healthy near-term economic outlook, Avoided Costs for the 2020 IRP 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 a 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 2020 CPA.[4]

Under the Company's 2021 proposed budgets and goals, the UCT benefit cost ratio is estimated on the portfolio level at 1.96 (1.60 for Residential and 2.26 for Commercial/ Industrial) and to have a 1.83 TRC (1.54 for Residential and 2.07 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. Additionally, incentive increases in 2021 (as a result of research from the CPA) paired with increased outreach due to COVID-19 to accommodate real-time adaptive management, will affect the results driving them closer

[4] 2020 Cascade Natural Gas Conservation Potential Assessment, AEG Applied Energy Group, Volume, Final Report 11/16/20 pgs. 8, 14, 41

to 1.0 UCT. Additionally, there will be costs not yet fully identified associated with implementing the benchmarking requirements of HB 1257 which will affect the portfolio level UCT/TRC.

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

WUTC UG-121207 offers guidance regarding the optimal method for the valuation of natural gas conservation efforts in the State of Washington. This document 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.[5]

The Company's approach to calculating cost-effectiveness reflects guidance from UG-121207. The Company held discussions with its CAG related to the policy statement, and ultimately moved towards the UCT as its primary valuation metric. This allows the Company to maintain and grow its WA programs fluctuations in the cost of gas notwithstanding, while recognizing the value of the efforts from a utility provider toward decreasing demand.

Thus, the UCT is the Company's preferred valuation as a straightforward calculation of the utility's investment in Demand Side Management that does not penalize customers for making independent determinations regarding the cost-benefit of an upgrade. The UCT treats the rebate from utility run natural gas efficiency programs as a leveraged partnership to drive positive market change through the installation of measures with long-lived deeper energy savings.

The Company also recognizes the Commission prefers valuation based under a fully balanced TRC. Based on this directive Cascade has contracted with AEG to review NEIs in depth during Phase 2 of the CPA to more accurately identify the impacts and benefits within its portfolio of measures, and is hoping to more fully incorporate them in the 2022 biennial conservation plan and following IRP.

[5] 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 effective as 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 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, 3.4% for the 2020 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 Local Distribution Companies (LDCs) and regional partners are applying discount rates and may explore revision of the discount rate in the future.

Industry standard cost effectiveness tests are performed to gauge the economic merits of the portfolio within the Company's LoadMAP model. Additionally, AEG incorporated placeholders for the RVT into LoadMAP alongside the UCT and TRC to allow future valuation under this regionally evolving metric. See Appendix A for AEG's definitions of each of the three final tests applied to the forecasts, UCT Achievable Economic, TRC Achievable Economic and RVT Achievable Economic. Please note these were provided as part of the original 2017 AEG CPA and will be revisited in the 2020/2021 CPA through Phase 1 and Phase 2 with AEG.

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

In Calendar Year (CY) 2019 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. This approach in Residential programs, when coupled with other program enhancements to customer service and Builder Program growth has yielded increased success and program growth. Cascade continues to evaluate the viability of its incentives and increases where prudent at portfolio levels as it proposes rebate updates.

2.4 Program Offerings

All items offered at the time of this writing (October 2020) are based on the 2020 IRP's Avoided Costs. Savings assumptions and targets were built from the AEG LoadMAP modeling tool and on-the-ground knowledge of Cascade's WA 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.

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 for 2021

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 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

Legend
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decreased
no change
increased

NEW HOMES	CURRENT REBATE	PROPOSED REBATE	OLD UCT	OLD TRC	NEW UCT	NEW TRC
Built Green Certified Home	$2,000	$2,000	1.2	1.8	1.5	6.4[3]
ENERGY STAR® Certified Homes + U.30 Window Glazing	$2,000	$2,000	1.1	1.6	1.3	5.3[3]
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	1.4	1.6
Attic/Ceiling Tier II - R49	$1.00	$1.00	1.1	1.3	1.3	1.8
Wall Insulation	$0.75	$1.00	1.4	0.8	1.6	1.1
Floor Insulation	$0.75	$1.00	1.1	1.6	1.3	1.3
Whole House Residential Air Sealing	$150	$150	1.3	0.6	1.8	1.2
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	2.1	1.1
Duct Insulation	$0.50/linear ft	$0.50/linear ft	1.3	1.4	1.6	-1.1
ALL HOMES	**CURRENT REBATE**	**PROPOSED REBATE**	**OLD UCT**	**OLD TRC**	**NEW UCT**	**NEW TRC**
Combination System (95 AFUE[1])	$1,250	$1,250	1.2	1.8	1.5	1.1
Boiler (30 yr. measure life)	$750	$750	1.1	1.6	1.6	1.4
Tankless Water Heater (one tier 0.91 UEF[1])	$250 & $350	$300	1.2 T1 1.1 T2	0.4 T1 0.5 T2	1.5	0.9
Energy Savings Kit 1[2]	$20	$20	1.2	0.6	0.0	0.0
Energy Savings Kit 2[2]	$40	$40	1.2	0.5	0.0	0.0
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[1] min)	$400	$400	1.2	0.7	1.2	0.7
Hearth/Fireplace (single tier 70 FE[1]+)	$300	$300	1.2	1.1	1.5	3.8

[1] Note acronyms: Annual Fuel Utilization Efficiency (AFUE); Uniform Energy Factor (UEF); Fireplace Efficiency (FE)

[2] No longer offered due to building code changes effective January 1, 2021

[3] In Phase I of the Conservation Potential Assessment, the LoadMAP model calculated updated Avoided Costs, Discount Rate and New Home assumptions to forecast Potential Savings. The calculation returned an anomalous 3x jump in the New Homes Program TRC over previous potential will be analyzed and resolved in Phase II of the CPA.

2.5.1 Summary of Proposed Residential Changes

Cascade had last planned a program update in mid-2020 to align with the building code updates in July. Due to COVID-19 the code change was postponed to the fall of 2020 and then to February of 2021. Many of the changes Cascade had intended for 2020 can now be put in place in early 2021. There is a possibility the Code update will be delayed again considering the continuation of the pandemic. In the event code changes are once more delayed the Company is still intending to file a tariff update around February to accommodate removal of the ESK kits (the RTF no longer supports claiming savings for these measures) and will update other program offerings not tied to the code. The Company will then make the changes tied to code requirements in a second tariff filing later in 2021.

New Home Measures

The Company will remove Programmable Thermostats from the New Homes rebate program as 5-2-day programmable thermostats are required in the impending Washington State Energy Code (WSEC) update. In place of these thermostats the Company is looking into potential additional savings provided by smart thermostats which can optimize the space conditioning routine in a home. The Programmable Thermostat rebate may remain available for existing homes, as code does not require programmable thermostats in existing homes.

The Company will also evaluate the cost effectiveness of home certification program rebates (ENERGY STAR and Built Green). As a result of the WSEC update baseline homes will be more efficient than currently required. Because these home certification programs are based on percentage savings above code, the deemed therms tied to these offerings will decrease; if homes are more efficient, then the same percentage of additional savings from home certification programs will result in less savings. Moreover, Built Green is currently revamping its point system and the savings tied to each tier of their home certification. The Company currently offers an incentive for a 3 star or above Built Green home, which offers 10% energy savings compared to a reference code home; it is unknown whether Built Green will keep this percentage the same or reduce it. The Company will also review these savings estimates with AEG as part of Phase two of the CPA.

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 EE department 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.

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

In 2018-2020, the Company experimented with a two-tier approach for Tankless Water Heaters (TWH). Currently the two tiers are for 87% Uniform Energy Factor (UEF) TWHs and 93% TWHs. Prior to the two-tier approach, the Company offered a single rebate for 91% Energy Factor (EF) TWH. Analysis of projects incentivized since February 2019 indicate 136 TWHs qualified for the lower tier and had a UEF of less than 91%. This represents 11.5% of TWHs incentivized through the Residential program, with the bulk of these lower tier options coming from new home builders. The Company proposes to remove the two tiers and offer a single rebate for TWHs 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.

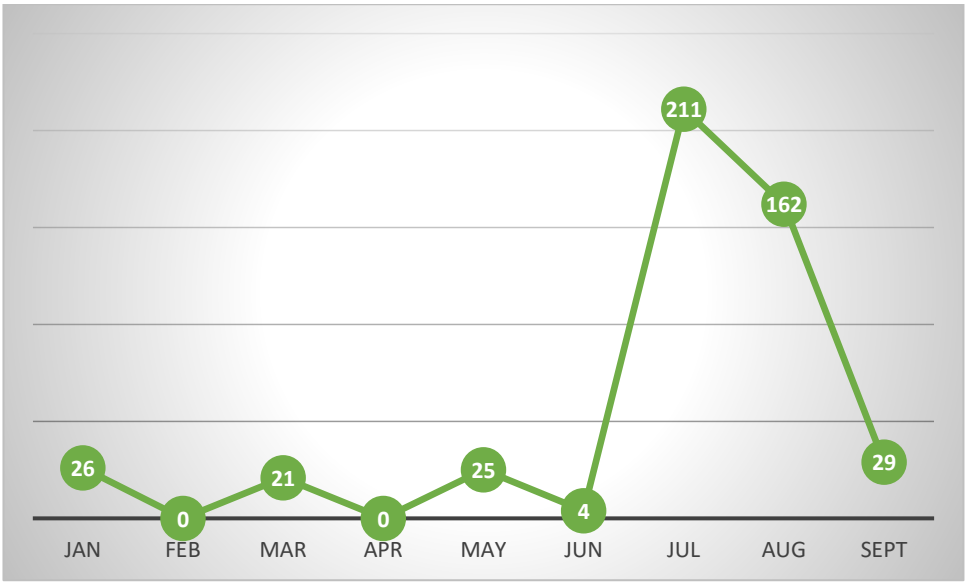
The current Energy Savings Kit (ESK) will become obsolete with the upcoming legislative mandate, “on or after January 1, 2021, the [faucets and showerheads] may not be sold or offered for sale, lease or rent in the state unless they meet the state's efficiency standards.” Note, the net effect on total 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 has offered Energy Savings Kits (ESK) to its customers who have an active gas account with CNGC and heat their water with natural gas, as a free water savings option since 2008. The residential kits are available in two options, ESK #1 which contains one Niagara 2.0 GPM shower head, one 1.0 GMP bubble spray, bathroom faucet aerator, one 1.5 GPM swivel kitchen sink aerator, one roll of Teflon tape, and instructions. The ESK #2 contained all of the items from the #1 kit but added a second

shower head and bathroom aerator. This free offering, while individually not realizing a lot of therm savings for the program has been an exceptional customer relations tool to introduce them to the EE program and pave the way for higher therm savings upgrades.

On a monthly basis Cascade inserts EE highlights in customer billing outreach. In July of 2020, in response to the COVID pandemic, the EE department highlighted the Energy Savings Kit as a no cost means to assist customers by reducing their energy consumption. CNGC has always had positive results and a low, if steady demand for the ESK offerings. However, this highlight was extremely successful resulting in 402 requests for ESKs between July and September and 478 in total year to date. On a yearly basis the company usually provides between 150 – 200 kits to its customers. The summer ESK offering proves a successful example of strategic, real time message adaptation to promote program uptake and interest in EE. See figure 1 for reference.

Figure 1: ESK Requests 2020



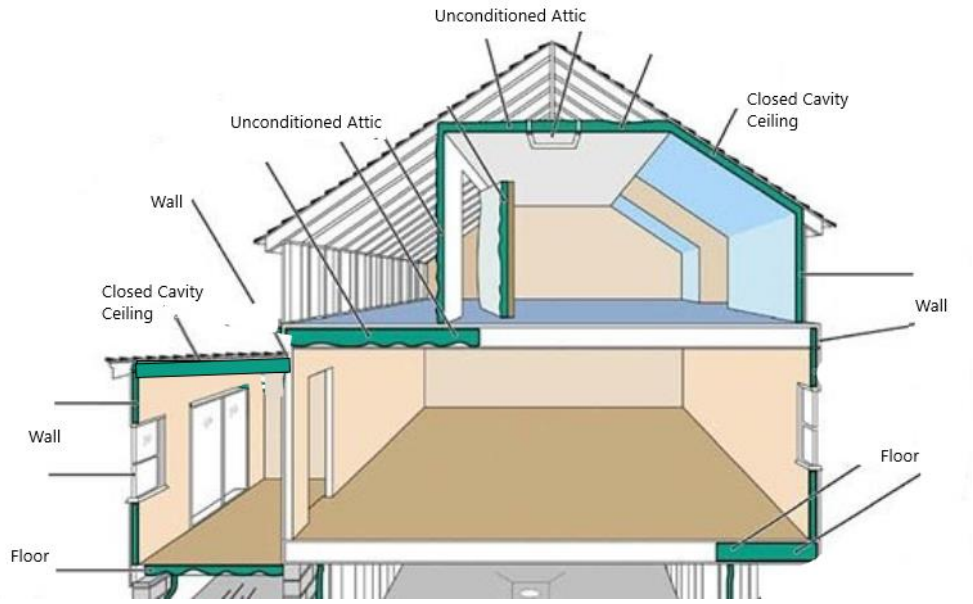
In January of 2021, WA is changing the Energy Codes and the ESK kits will no longer be offered as an Energy Savings option for customers. The company is researching other energy saving low cost/no cost options as the program has proven to be a positive relationship builder and an entryway into the EE Program. Some potential alternatives include free shower timers with tankless water heaters, reduced rate furnace cleanings and inspections and furnace filters. Cascade will explore options further with AEG in Q1 2021 for other alternatives.

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. Since the tariff change on Feb 19, 2019, only 5% of Attic

Insulation rebates have been for homes with R-38 Attic insulation. Removing the R-38 Tier 1 offering will encourage customers to consider insulating to higher levels.
The program will also explore raising the rebate amount from $0.75/sq. ft to $1.00/sq. ft for Wall and Floor Insulation (as supported through the UCT). By increasing the rebate, the even dollar amount could simplify rebate estimates for contractors and customers while maintaining a UCT close to 1.0. 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. Cascade will work with AEG through the CPA to verify deemed savings for these measures and confirm they are included as part of the potential study in Phase 2. 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 2: Insulation Types



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

The Company 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 22 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 WA 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. Cascade has discussed this with its CPA vendor as well.

The Company has had great success with the custom project path in the Commercial Incentive Program. Cascade is now proposing adding a custom path to the Residential Incentive Program to incentivize projects that may not lend themselves to prescriptive listings, but do fall within the potential identified by AEG. This option could provide prospects to promote savings far beyond what is possible through the Company's current Residential offerings. This path will require energy modeling to verify customized savings from these upgrades and to determine rebate amounts.

The company will research the possibility of removing Bundle B and expanding Bundle A to include Duct Sealing, Duct Insulation, Attic, Floor, and Wall Insulation. Bundle A may also transition to a $500 bonus if cost appropriate.

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	1.69
Energy Saver Kit A	PRSV <=1 gpm/ Aerators <=0.5 gpm	$119 (value – free to customer)	$119	1.95	0.86
Energy Saver Kit B[2]	Showerhead <=1.8	$44 (value – free to customer)	$44	4.33	0.0
Domestic Hot Water Tanks	Minimum 91% AFUE or 91% Thermal Efficiency	$2.50/kBtu/hr	$2.50	0.98	1.73
Tankless Water Heater	Minimum 0.82 Energy Factor	$120/gpm*	$120	1.15	1.53
Tankless Water Heater 2nd Tier	Minimum 0.93 Energy Factor	$150/gpm	$150	1.38	2.00
Motion Faucet Controls	<=1.8 gpm, WaterSense Certified	$105	$105	0.62	0.92
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	1.98
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	1.99
3 Pan Steamer	>=38% Cooking Efficiency, <=2083 Btu/hr/pan Idle Rate	$850	$850	1.29	1.81
6 Pan Steamer	>=38% Cooking Efficiency, <=2083 Btu/hr/pan Idle Rate	$1,200	$1,200	1.36	1.91
Double Rack Oven	>=50% Cooking Efficiency, <=35,000 Btu/hr Idle Rate	$2,500	$2,500	1.34	1.99
Gas Conveyor Oven	>=42% Baking Efficiency	$450	$450	0.92	1.10
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

[1] Note acronyms: Domestic Hot Water (DHW); gallons per minute (gpm)

[2] No longer offered due to building code changes effective January 1, 2021

Table 8 – Commercial Program Proposed Changes continued on next page

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	1.93
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	2.19
Tier 2 Attic Ins R-45	Tier 2 / Minimum R-45	$2.50/sqft	$2.50	1.28	1.93
Tier 1 Roof Ins R-21	Tier 1 / Minimum R-21	$2.00/sqft	$2.50	1.57	2.94
Tier 2 Roof Ins R-30	Tier 2 / Minimum R-30	$2.50/sqft	$2.50	1.39	2.73
Tier 1 Wall Ins R-11	Tier 1 / Minimum R-11	$1.25/sqft	$1.25	1.28	1.93
Tier 2 Wall Ins R-19	Tier 2 / Minimum R-19	$1.50/sqft	$1.50	1.27	1.92
Convection Oven-Rest	>=44% Cooking Efficiency, <=13,000 Btu/hr Idle Rate	$800	$800	1.39	2.13
Gas Griddle-Rest	>=38% Cooking Efficiency, <=2,650 Btu/hr Idle Rate	$500	$500	1.23	1.73
Low Temp Door Dishwasher	<=0.6kW Idle Rate, <=1.18 gal/rack	$800	$800	1.24	1.74
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**

Legend
removed
decreased
no change
increased

Windows (tier2 U-0.28-0.30)	U-0.28-0.30	N/A	$5/sqft	N/A	TBD T2

2.5.2 Summary of Proposed Commercial Changes

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

Possible new prescriptive/standard measures:

- Mid-Efficiency Boilers. One potential new measure worth evaluating for 2021 is a mid-efficiency boiler (non-condensing but in the range of 85-88% 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 measures are currently run as custom, but a standard offering represents an opportunity that customers might otherwise overlook. 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.

- Demand Control for Kitchen Hood Makeup Air Units. These systems are installed in commercial kitchens and consist of utilizing variable speed drives and coordinated DDC control to reduce kitchen exhaust hood make up air requirements and their attendant heating energy costs. This is a measure which has been processed as custom and could possibly benefit from more uptake if offered as a prescriptive measure.

Possible existing prescriptive/standard measures with good opportunity for promoting additional uptake

- Pipe Insulation. The incentive available for insulating pipes is generous and offers a low-cost opportunity. While TRC Companies, Inc. has had a hard time finding contractors focused on this measure, several TAs have mentioned that they could offer it, they just have not found a viable market. As meetings with TAs resume, post-COVID-19, this will be a point of emphasis for the C/I vendor's staff.

- Demand Control Ventilation (DCV). In addition to continued conversations with other utilities (Bonneville Power Administration and Pacific Power specifically), opportunity exists to educate customers on the potential to receive an incentive

from both their electric and gas utility for DCV. As a measure, DCV has continued to grow in terms of uptake, but with Advanced Rooftop Units continuing to lag in terms of market penetration, there is still significant room for growth.

- 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 were required by code in 2020, although the new Appliance Efficiency Standards Bill - HB 1444 will require revisions to the C/I program offerings in 2021 (see Emerging Technology & Building Code section).

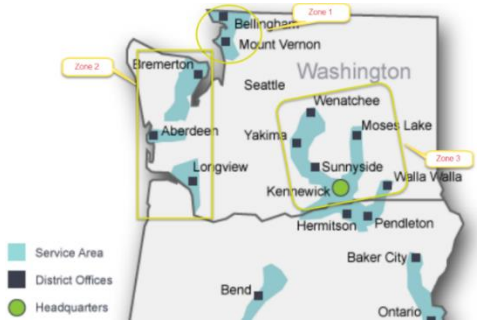
2.6 AEG CPA Library

The AEG CPA provided an update to the equipment and non-equipment measure libraries for the Residential and C/I programs. It also synced 2019 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 Phase 1 of the 2020 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 from which to work in developing the new model and CPA.

Note: adjustments reflected the unique climate zones noted in Table 9 for the Company's WA 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

In the coming years, high-efficiency measures that were once above code will become a standard code requirement. As such, it is important for Cascade to explore alternative offerings for above code energy saving measures. These measures include advanced envelope materials and practices; advanced window insulation; drain water heat recovery; and gas fired heat pumps (for space and water heating). CNGC collaborates with Regional and Technical partners, including the GTI, NEEA, and the Regional Technical Forum (RTF) to ensure Cascade's technology roadmap is current and relevant.

In the Residential Sector there are several Emerging Technologies that have the potential to surpass building code requirements and increase natural gas energy savings. The following are some of the most intriguing and viable advances in emerging technology that can be considered for the Cascade programs:

Advanced framing:

Thermal Break Sheer wall (TBS):

Once a wall is constructed, a continuous layer of rigid foam is placed between the framing and the exterior plywood sheathing. According to a NEEA report on high performance wall assemblies released June 4, 2020 this seamless layer of foam reduces direct pathways for heat to escape the building, and provides lab verified seismic resiliency benefits. The report details that TBS walls can be constructed with commonly available building materials, or builders can choose to purchase prefabricated exterior sheathing with the layer of continuous foam already attached. The layer of foam, which would be an inch thick, adds an additional R-5 of thermal insulation to the wall assembly. NEEA reports an incremental cost of $1.12/sq. ft. in materials and $0.25-$0.30/sq. ft. of labor for a total incremental cost of $1.37-$1.42/sq. ft. This is an approachable high-performance wall builders can start using today.

Advanced Air Sealing:

AeroBarrier® is a proprietary technology produced by Aeroseal® which uses aerosolized sealant in conjunction with a blower door. The blower door forces air into the home and pushes the aerosolized sealant into all gaps in construction materials that are ½" or less in size. This approach to whole house air sealing has been a common practice for air sealing duct systems for decades; it is a fast and efficient approach to air sealing and produces reliable and consistent results. According to the Zero Energy Project organization, the cost to install AeroBarrier is $0.80-$3.00/sq. ft. of floor area, depending on how tight a builder wants the home. The high upfront cost may be offset by reducing other materials and labor currently used to achieve the same levels of air tightness. The technology can provide air tightness that will meet code (5 ACH50) and can be as tight as the passive house standard of 0.6 ACH50. This is a market ready technology that is available for builders today.

Fenestration:

Thin Triple Windows:
According to a NEEA report released April 30, 2020, windows account for roughly 7% of a building's surface area, yet are responsible for roughly 48% of envelope heat loss. To combat this thermal conductivity NEEA is working on a market transformation strategy to bring thin-triple-pane windows into new homes. This new class of windows have an insulation value of R-5, or a 0.2 U-value, which represents an increase in efficiency of 50%. This window uses thin glass as the middle layer, which became affordable due to the high demand for the material used in high definition TVs. This glass is used in

conjunction with krypton glass housed between the windowpanes (typically argon gas is used in multi-pane window assemblies). The report provides an estimated incremental cost of $2-$4/sq. ft. of glazing. The market transformation effort focuses on removing barriers to widespread adoption, which include developing high volume production processes, and leveraging regional partnerships with utilities and educational/technical partners to ensure demand for the windows exists. With this drop-in solution to reducing heat loss through glazing, builders will be able to address one of the least efficient components of the building envelope. With no definitive time to market more work will need to be done to accelerate investment into manufacturing processes and increasing awareness of the product.

Drain Water Heat Recovery (DWHR):

This technology captures the waste heat from hot water that goes down the drain via a coil wrapped around the drainpipe. This coil has incoming water, which absorbs heat from the drainpipe carrying heated wastewater. The transfer reduces the temperature delta of inlet water and the home's water heater, reducing energy consumption for water heating. This is a technology that is ready to go into new homes today. Retailers such as Lowes and Home Depot sell these units; three of the biggest names in this market are Power-Pipe, Thermodrain™, and Ecodrain™. The average cost for a DWHR unit is in the hundreds of dollars, ranging from $500-$900 per unit.

Gas Fired Heat Pumps:

Gas fired heat pumps use a small, gas powered engine, to run the compressor and pump system on a heat pump. It relies on the thermodynamic principle used by existing electric heat pumps. This technology can be used for both space and water heating applications. They offer up to 50% more efficiency than high efficiency furnaces, which have enormous potential for savings in new and existing gas homes. According to a technology rollout road map produced by GTI in November 2019, the short-term goal includes rolling out products for use in residential homes by 2025, with a long-term goal beyond 2025 to have cost effective units available for the new home market. In conjunction with the California Energy Commission, GTI found that gas fired heat pump water heaters could provide 60-65% savings over gas storage tanks, and savings of 30-35% over TWH. This combination could produce payback windows of 4.5 – 8 years, with a 1.5-2.5-year payback compared to electric storage heaters.

Through NEEA, Cascade and other Northwest gas funders are working on a range of projects and activities to bring emerging technologies to Northwest customers, including the following:

- Joining a North American field demonstration for an absorption gas heat pump product, expected to come to market in 2022
- Joining the North American Gas Heat Pump Collaborative, which is made up of more than 14 utilities representing more than 27% of US and Canadian households that use gas. This Collaborative's mission is to develop and implement activities to accelerate the adoption of gas heat pump technologies
- Testing additional applications of gas heat pump technology for residential space heating and combination space and water heating. Both are currently available and emerging technologies are being evaluated for market readiness, performance and safety
- Exploring opportunities to differentiate and promote efficient RTUs in the market. This work is based on newly developed test procedures and metrics that make it easier for building owners to identify and choose energy efficient options. NEEA will continue to develop the opportunity in 2021-2022

Code updates

On February 1, 2021 the 2018 WSEC will take effect. The main changes from the code update to impact the Residential program involve requirements for all new homes to include 5-2 day programmable thermostats (this will eliminate the offering for new homes), and an update to section R406 of the WSEC which details the energy efficiency requirements for new homes. Included in this update to R406 are changes to the points available for high efficiency gas measures, and an overall increase in the number of credits required for all sizes of homes. The increase in points for small and medium size homes is significant to Cascade's efficiency program, as these two house sizes are the primary focus for builder rebate submissions. Small homes currently require 1.5 credits and will need 3 credits under the updated code; medium homes currently require 3.5 credits and under the new code will require 6 credits to meet code.

Although beneficial for overall efficiency efforts; these updates may remove gas potential savings as builders could revert to electric only solutions or simply choose high efficiency gas equipment out of necessity. While high efficiency options will not be required, they may become the standard. Fortunately, there are abundant savings to be captured in new homes through improved building envelopes, although it is important to note these upgrades do come at a higher price point.

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 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 programs. The Company's 2020 IRP provides information on environmental externalities (legislative bills) that 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 2021 will see additional discussions and workshops amid Commission direction on implementation of the legislation passed in 2019.

The following section provides context on changes and efforts planned for the CY 2021 and CY 2022 EEIP outside of rebate updates noted in section 2.5.

3.1 Energy Efficiency Programs in 2021

The 2020 CY was focused on customer support above all else. While the year started with the same driver for program goal achievements as was the case for the past three years, three months into the program year the nation transitioned into a new business model. This required the Company to focus more on assisting the customers as a viable and essential partner in the community, with cost savings even more in the forefront of purchase decisions because of economic slowdowns paired with more time spent in the home. Program implementation centered on review of application requirements to accommodate limited contractor interactions while still providing exceptional service to the customers in this remote environment. As the Company wades its way through COVID-19 impacts and looks toward a more traditional delivery format in mid-2021, it's prudent to assume impacts will continue well into this program year. Residential program participation was consistent throughout the first 7 months of the pandemic, and all signs indicate it will continue in an upward trajectory along with the seasonal increase around fall. The C/I program uptake lagged and will require significant effort to offset economic impacts from COVID-19 in the new year.

At this point, the Company is planning the following efforts in CY 2021 and will remain flexible to accommodate new outreach opportunities and technology to assist in program delivery:

- The NEEA gas market collaborative is well into its second cycle. The Company continues working with the collaborative on the operation plan activities for cycle 6 (2020-2024). CY 2019 provided the first reportable savings from the market

transformation efforts through NEEA. As these savings become more impactful later in the cycle 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 was renewed in 2020. The Company will implement a new Public User Experience (PUX) in 2021 to enhance the online application process for customers and transition to a new Trade Ally Software platform through Nexant to improve TA benefits and availability to customers. The evaluation Measurement and Valuation (eM&V) program within iEnergy will be available for the Company's use in 2021 which will enable Cascade to perform more internal eM&V (a pilot was run in 2020 to explore the internal processes and help customize the software further). 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.

  Explore limited residential custom offerings – The Company is tasked with offering all possible energy saving opportunities through its programs. In light of the increased residential goals and unknown impact of COVID-19 the program is considering incorporating a form of custom incentive support through the residential programs. In the past custom has solely been supported for the C/I program based on the administrative burden associated with customizing calculations and savings. As there are significantly more residential participants it was prudent to minimize admin burden and follow industry practices for the residential program through deemed savings offerings. While this model simplifies program delivery it has left savings on the table for residential projects that don't fit into the specific criteria and yet have potential to save customers significant therms through proven technology upgrades (residential roof insulation for example). The Company will research software available for residential project cost/benefit calculations, similar to the Department of Commerce software used for the Low-Income program as well as that used by its C/I vendor to run analyses. Cascade will coordinate with the CAG to review logistics including tariff requirements, staffing needs and clarification on when a custom residential offering could be provided.

3.1.1 Point of Sale Rebates

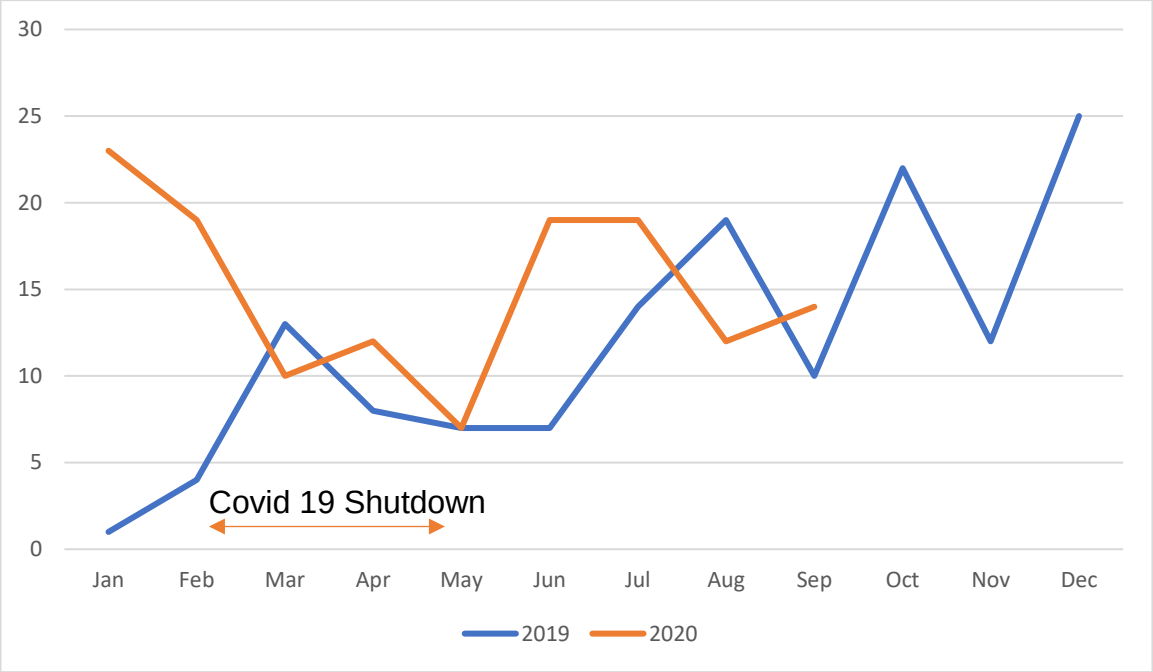
In 2019, Cascade started a Point of Sale (POS) pilot program to offer instant rebates to customers through partnership with a select set of Trade Ally contractors. The instant rebates are intended to benefit everyone involved in the application process. The contractor can use it as a sales tool, the customer receives a discount in the amount owed at the time of purchase, and the utility ideally receives clean, more complete rebate applications for quick processing.

In 2020, the POS instant rebate process successfully moved out of the pilot phase and into a standard offering for Trade Ally contractors. To date, 14 contractors across the service territory have signed to offer POS. However, the majority of participating Trade Allies (8) are in Zone 1. Through the POS rebate process, a Trade Ally contractor deducts the rebate amount from the final bill, submits all completed paperwork to Cascade, Cascade expedites review and then is reimbursed by the Company after the incentivized measures are approved.

As with all new process implementations, there were some hiccups with contractors when they initially started this new process. To help prevent this, Cascade required all Trade Allies wishing to continue offering instant rebates in 2020 to attend a virtual training in the spring. Due to its success, all new contractors intending on offering instant rebates will need to participate in the same training.

Due to COVID-19 limitations the program experienced a slowdown in application submittals, but many of the contractors are rebounding from that initial interruption to workflow. The program paid 138 rebates to 9 contractors in 2019, and 2020 is aiming to surpass the previous year with 136 rebates already paid to 11 contractors between January and October of 2020.

Figure 3: POS Rebate Submission



As Figure 3 shows, 2020 was projected to continue the growth that 2019 created and trends indicate the latter part of 2020 is picking up again. The Company anticipates that 2021 will continue this submission growth as well as an increase in Trade Ally contractor participation.

Cascade had communicated with several new contractors about POS rebates after the regional Home and Garden shows in March but did not revisit the discussion due to many businesses closing for months. The Company will reach out to these contractors again in early 2021 with general program updates and will discuss POS rebate benefits. Previously, Cascade relied on in-person or phone communication, but due to the influx in remote work and digital meetings, in ways, it has become easier to communicate with contractors in the Company's harder to reach service zones. Zone 3 currently has the fewest participating contractors; therefore in 2021 Cascade will work to increase participants in eastern Washington.

Residential Regional Partnerships

In 2020 the Company had planned a cross utility collaboration pilot on diagnostic energy audits for residential Puget Sound Energy & Cascade customers. Representatives from Cascade and Puget Sound Energy explored the overlapping territory and discussed collaboration opportunities. While full funding of audits was unlikely, there was still

potential to offset auditing costs for customers when they installed multiple measures. This effort did not move forward due to funding availability from the other utility, however Cascade is now seeking ways to offer light audits through virtual software and coordinating with local energy programs through existing auditing offerings when COVID-19 restrictions ease.

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 seeking updated guidance from AEG through the 2020 CPA to balance the TRC and will work with its CAG and AEG in CY 2021 to identify next steps.

As part of this process the Company will evaluate NEIs or Non-Energy Benefits for both the Residential and C/I program, seeking more granular understanding and reportability. Currently the C/I program is using two basic types of NEIs, 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 NEIs cited in the literature related to energy-saving endeavors, below are the subset the Company currently considers:

<u>Societal NEIs</u>

- Positive Economic Impacts to the Community – This is related to quantification of NEIs 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.
  Positive Economic Impact NEI=.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 NEI = PV (interest rate, measure life, ($42/metric ton x 11.6 lb. CO2/therm saved)/(2200 lb/metric ton))

<u>Participant NEIs</u>

- 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 NEIs 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.
  Property Value Benefit NEI=.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.
  Reduced Maintenance Cost NEI = 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.
  Water/Sewer Reduction NEI = PV (interest rate, measure life, ($2 x 1000 gall))

3.1.2 Intake and Analysis

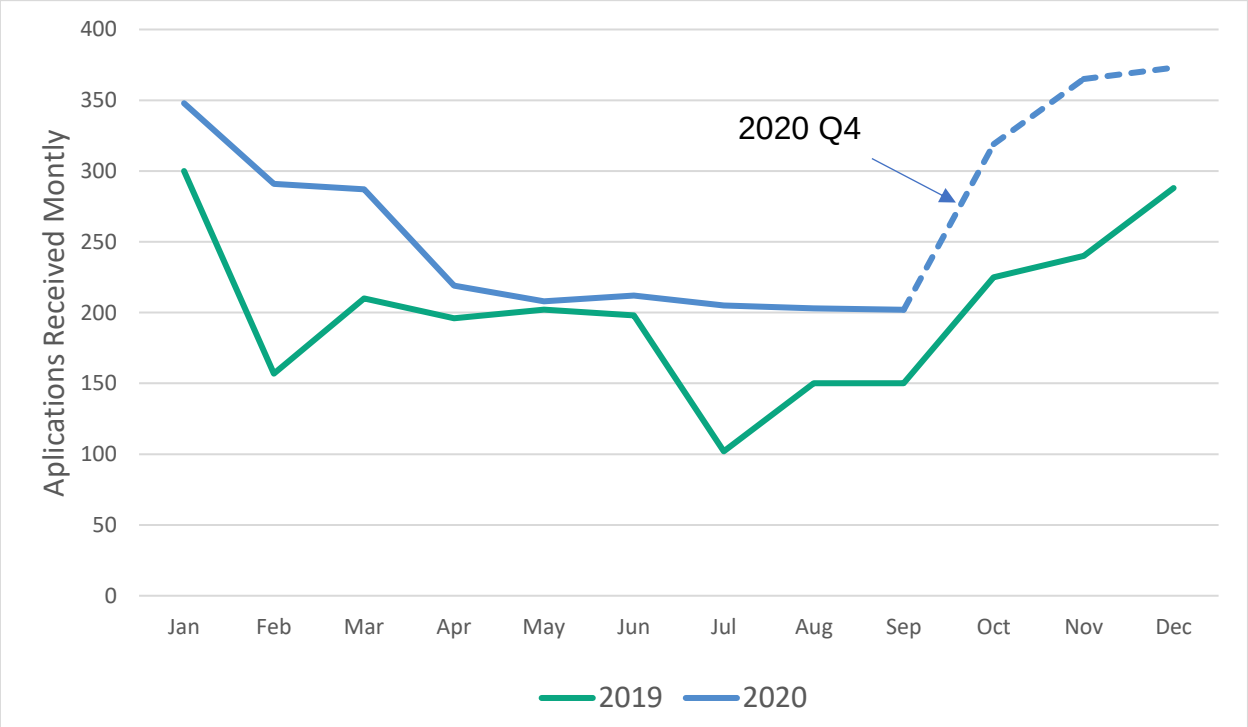
Cascade's EE team continues to see growth in the Residential rebate program submission rates over the past couple of years. In 2019 the Residential program received 2,418 applications by means of direct mail, faxes, and emails; this does not include application submitted through the CNGC online interface.

The 2020 year started off strong receiving 348 applications in the month of January. The program typically begins to experience a slowdown in February and then picks up again during the spring. Historically during the summer months the program experiences a second slow down and picks up again during fall and winter.

In March of this year the program experienced another slowdown in the residential program, however by April the program leveled off and in some aspects seemed to

recover and maintain a steady intake of 200 applications per month throughout the summer and into fall. If the projections from the Company's internal forecasts (dotted line in figure 3.2) come to fruition the program should experience a steady increase of applications throughout the last quarter of 2020. The projection is based off of the past forecasts and projections over the last three years and the growth seen over 2020.

Figure 4: Monthly Intake Plus 2020 Q4 Forecast



The future is always an unknown and the company cannot guarantee the results in the coming months or years, however it can adapt to change and be creative with messaging to customers to promote uptake through the EE program. Cascade has already begun adapting to the changes and government mandates from the COVID-19 pandemic by advertising in new markets including increased Social Media presence, Virtual Home Tours, offering virtual inspections, and supporting Trade Allies through extended value on Bonus Coupons, radio advertising and reaching out to new markets via targeted community magazines.

3.1.3 Missing Information Tracking and Analysis

At the beginning of 2020 the EE department began tracking missing information (MI) projects. The projects are tracked through a weekly report delivered to the department

that keeps the team up to date on how many projects have MI, how long the projects have been in the MI status, and which contractors have submitted invoices with MI. These metrics provide key insights that enable the EE department to address systemic problems resulting in project delays.

Through root cause analysis the department has formed a handful of solutions to address this ongoing issue. These solutions include: training videos to show exemplary invoices that can be used as guides by TAs; open and frequent communication by the TA manager with contractors that continuously submit project invoices missing relevant info, and updating the residential rebate application to better highlight information required to pay out rebates in addition to reassessing application questions used to determine eligibility.

MI takes additional processing time, increases the received-to-paid date of rebate applications, and produces an overall poor customer experience. Weekly MI project tracking increases Cascade's ability to address the issue and is integral to improving the customer experience.

3.1.4 Inspections

Due to the onset of COVID-19, the Company is adapting its historic approach to quality control inspections by shifting to a virtual inspections platform paired with in-person review when viable. The Company purchased software specifically designed for virtual inspections which will allow Company staff to perform fully immersive inspections, on-site, without travel. Virtual inspections make in-progress inspections and the proper assessment of equipment and measure installs easier. It also enables increased installation inspections rates as a means of confirming program integrity and customer satisfaction.

The Company will use the software internally and make it available to its third-party contractors to support their efforts on Cascade's behalf. For Residential in Climate Zone 3, Sustainable Living Center will have access to the software platform for virtual inspections. Internal EE staff will perform inspections in Climate Zones 1 and 2 for the Residential program. The Company will also provide access to the inspection software to TRC Companies, INC., for C/I inspections. TRC Companies, INC. performs inspections in all three Cascade Climate Zones.

Residential Inspection Criteria

- All residential incentives in excess of $2,500 are inspected
- New Trade Allies are targeted for inspections until they establish adherence to program requirements

- Customer complaints or concerns
- Staff can inspect projects based on complexity or anomalies
    - Staff will select projects for inspection randomly with project eligibility confirmed prior to the inspection

C/I Inspection Criteria

- Radiant Heating, Condensing Boilers, Domestic Hot Water Tankless and Insulation measures incentives in excess of $10,000
- All other industrial incentives in excess of $5,000
- Custom projects receiving a rebate over $5,000
- New Trade Allies are targeted for inspections until they establish a precedent
- All insulation installed by facility staff vs insulation contractors
- Staff will select projects randomly

Cascade is also looking to leverage the Virtual Inspection tool as a means to perform lite energy auditing. Energy audits are a way for business and homeowners to understand how and where they use energy and are a service Cascade has not yet provided to its customers because of the cost and resource requirements. Energy audits can be categorized into 3 broad types:

Walk Through Audit – Inspection of a building to identify maintenance, operational or deficient equipment issues and also to evaluate areas that need further evaluation. The results of a Walk Through Audit include identification of EE opportunities, a qualitative analysis of energy saving measures and an estimate of savings potential. Project feasibility is included.

Energy Diagnosis – Economic calculations to identify actual energy consumption and losses. The results of Energy Diagnosis include energy use breakdowns and financial analysis for each measure in order to categorize and prioritize implementation of the measures.

Investment-Grade Audit – Analysis of capital-intensive improvement using rigorous engineering analysis. This type of audit is a qualitative study of implementation with detailed investments, operational and maintenance costs. The results of an Investment Grade Audit include real energy demand and energy use breakdown. This audit supplies a financing plan as well as implementation and savings verification plans.

Cascade is working on a process to support some type of audit and would like to provide

Walk-Through Audits and possibly Energy Diagnosis Audits. The intention of this offering is to move customers toward EE actions by serving both the Residential and C/I sectors.

3.1.5 Commercial/Industrial Updates

The Cascade C/I program foresees several opportunities for pilots, regional partnerships and access to hard to reach markets throughout 2021. Many of the efforts planned for 2020 were delayed due to COVID-19 restrictions, and they will be explored further in 2021, safety permitting.

Pilots

PoS – The residential program experiences success with POS projects offered through its Trade Allies. POS has also been an option through the C/I program via its Assignment of Funds requirements. However, because the incentives are often larger for the C/I program, they represent a higher risk for the contractor to absorb cost should an error occur, which has resulted in limited program adoption on the commercial front. The C/I program will attempt to identify three (3) contractors willing to participate in a C/I focused POS pilot in 2021 to drive uptake.

Radiant Heating Partnership – The popularity of this technology is increasing, especially in the residential space, but there is also significant opportunity in the industrial and commercial space. The C/I program's focus on this measure in 2020 will grow into a deeper focus in 2021. In mid-2021, the C/I program will explore a partnership opportunity for a cross promotion with Grainger or another manufacturer.

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– 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.

C/I 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 (Puget Sound Energy, 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 is 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, Seattle City Light 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 TRC C/I representative in Zone 3. The Company will seek similar opportunities with other regional utilities throughout its territory.

TWH Midstream Program

The CNGC C/I team began a pilot project focused on TWHs. This midstream program, which began in August 2020, is focused on distributors and will continue to expand in 2021. In addition to identifying new distributor participants, the TRC Company, Inc. team will develop additional support materials to streamline the process for receiving incentives.

3.2 Conservation Programs in 2022

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 EE 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 2022 and beyond: Heat Pump Water Heaters; Laundry Water Recycling; Laundry Dryer Heat Recovery; Waste Heat Condensing Economizer; Waste Heat Pumps; and Efficient Rooftop Units (CRTUs). NEEA is currently conducting research on a variety of measures for RTUs As NEEA further reviews barriers and opportunities the Company would be interested in promoting pilots within Cascade's territory to support further research.

3.2.1 Planning and eM&V

This section provides a Recap of the eM&V program and an Update for the 2020 – 2021 Program year.

RECAP

Cascade's CAG recommended the Company conduct internal, transparent eM&V of its EE program 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 WA 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.

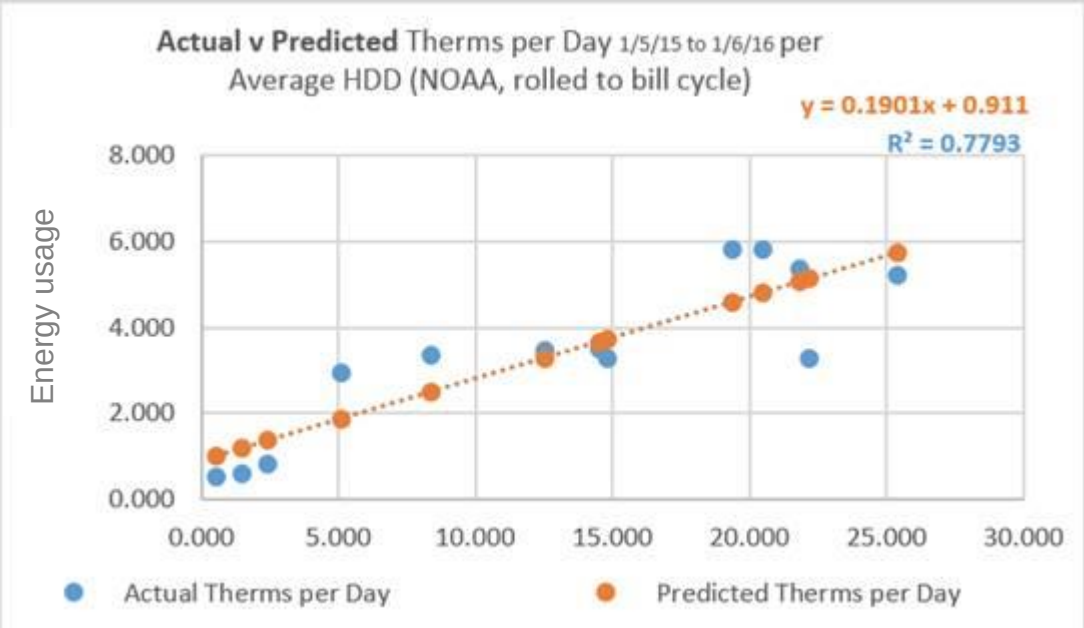
Process evaluation plays an important role in the overall context of a program evaluation. The primary purpose of the eM&V is to develop accountable recommendations for program design and operational changes that can cost-effectively improve program delivery.

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

Figure 5: 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 clarified 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 CPA
- 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.

UPDATE 2020 – 2021 Program year

In January 2020, the EE department partnered with the Western Washington University institute of Energy Studies to offer an internship to a qualified student graduate who planned on taking a position with an Energy Services Company after the 3-4 month internship Her internship project was the eM&V pilot, and this role included identifying customers with the requisite usage data from the eM&V database, determining if there were subsequent factors that would disqualify the account, i.e. multiple heating measures installed causing an interactive effect, and then surveying the customer to determine if there were changes in the year following the installation, i.e. a new family member.

eM&V system design issues prevented the intern from being able to use automated functionality to derive the sample and data quality issues impacted the use of the regression analysis.

Despite these setbacks, the intern was able to gather an eligible customer sample of twenty and proceed to the survey step. In the course of this project she refined the survey design to capture more meaningful feedback from the customers, tracked responses and conducted analysis on the results. She also wrote a Summary of her findings. The following customer comments, Figure 6 and 7 graph of results are from her Summary. While the sample is not large, it provides both insight into the customer experience as well as the groundwork for future broader evaluation efforts.

Figure 6: Customer Experience eM&V Pilot responses

Rebate Experience Stats:

Seven out of ten candidates rated their rebate experience a five out of five, exceptional! The other three candidates rated their experience a four out of five.

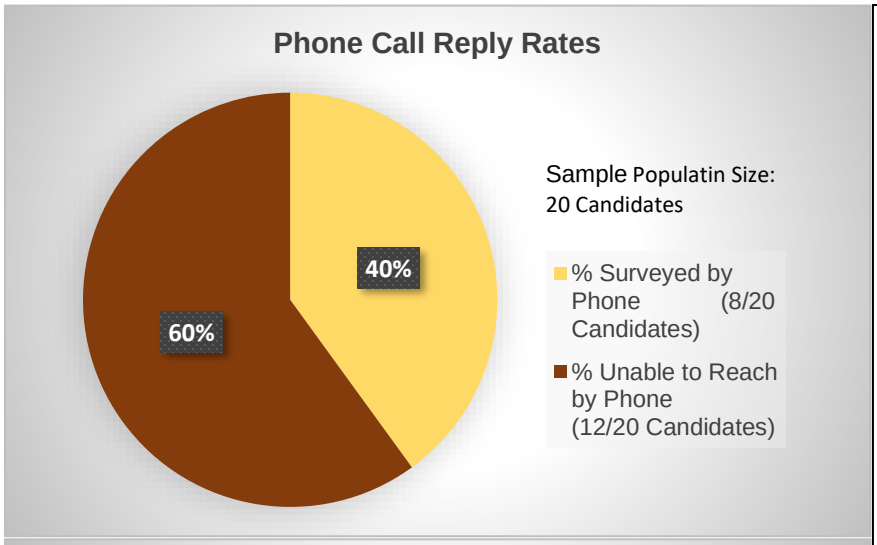
Seven out of ten candidates said they invested in efficiency because of Cascade's rebate

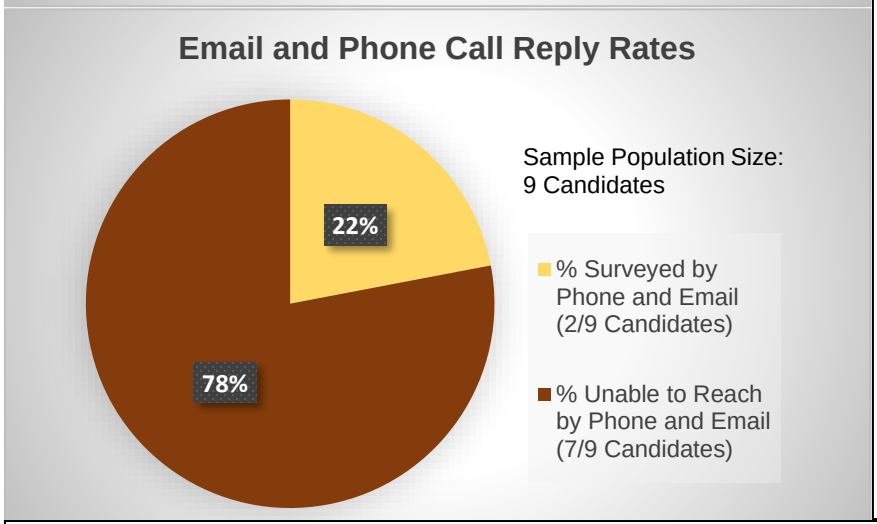
Five out of ten candidates thought the rebate amount given was just right, three thought the amount was generous, and two thought the amount was low "compared to other companies".

Notable final comments made by candidates:

"Installers and contractors should always provide Cascade's rebate information, the availability of this rebate helped us out a lot!"

Figure 7: Customer eM&V Pilot eligibility survey results





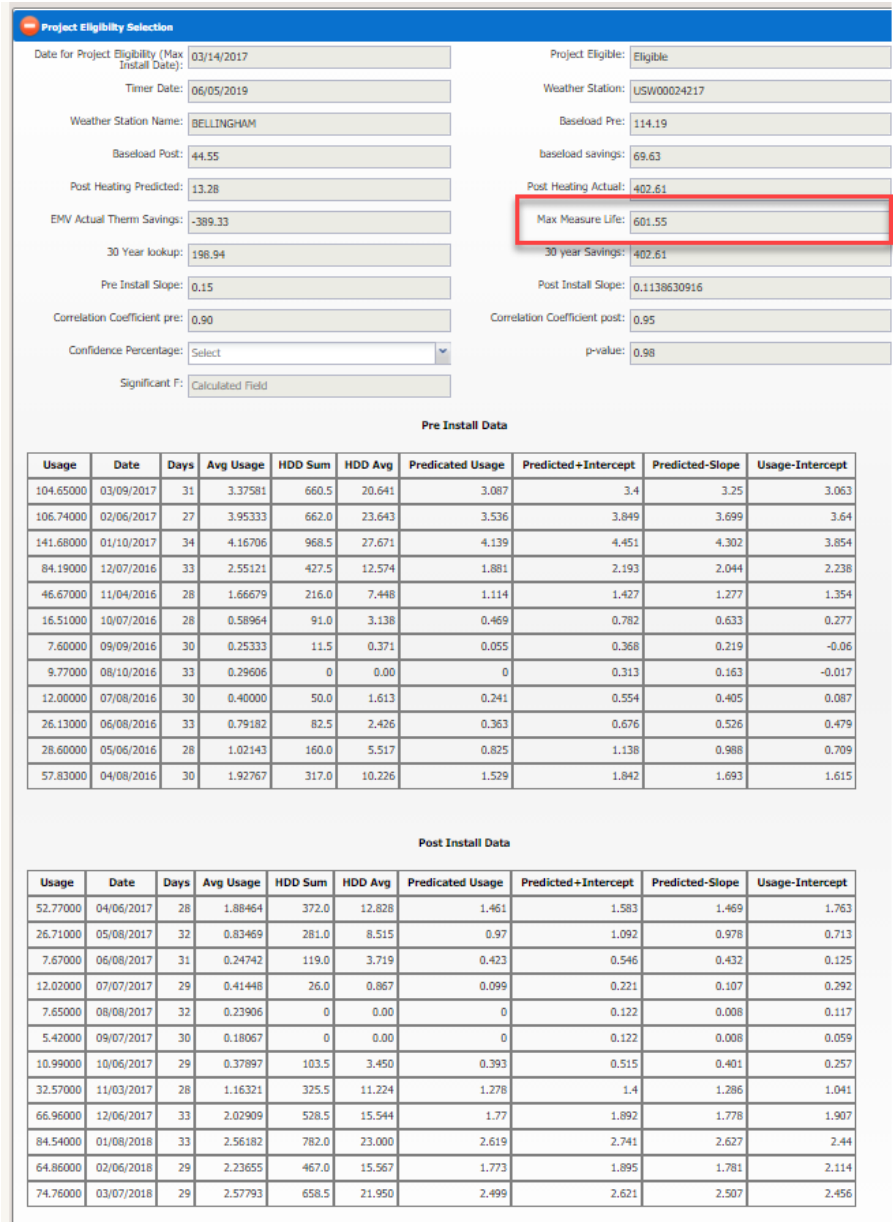
All twenty candidates in the sample group were called multiple times. Some answered on the first call, some on the second or third, and some never answered. Eight of those twenty candidates answered their phone and participated in the survey. This left the Company with twelve candidates still uncontacted. Nine of those twelve candidates provided their emails over the Company's Billing system. Two of those nine candidates emailed back survey answers. Please reference the two pie charts on the left to help visualize this data.

Overall, the Company successfully surveyed eight people over the phone and two people through email. One candidate was disqualified because of an add-on to his home. Nine of the ten surveyed candidates qualify for further eM&V research.

This summer, Nexant and MDUIT worked through the quality issues with the monthly customer usage data uploads. A subsequent User Acceptance Test by Cascade identified the measure life field contained errors, see Figure 8.

EMV-Snippet EMV_98967 (EMV_92220)

Figure 8: DSMC eM&V project eligibility factors and data usage by customer



Project Eligibility Selection

Date for Project Eligibility (Max Install Date):	03/14/2017	Project Eligible:	Eligible
Timer Date:	06/05/2019	Weather Station:	USW00024217
Weather Station Name:	BELLINGHAM	Baseload Pre:	114.19
Baseload Post:	44.55	baseload savings:	69.63
Post Heating Predicted:	13.28	Post Heating Actual:	402.61
EMV Actual Therm Savings:	-389.33	Max Measure Life:	601.55
30 Year lookup:	198.94	30 year Savings:	402.61
Pre Install Slope:	0.15	Post Install Slope:	0.1138630916
Correlation Coefficient pre:	0.90	Correlation Coefficient post:	0.95
Confidence Percentage:	Select	p-value:	0.98
Significant F:	Calculated Field		

Pre Install Data

Usage	Date	Days	Avg Usage	HDD Sum	HDD Avg	Predicated Usage	Predicted+Intercept	Predicted-Slope	Usage-Intercept
104.65000	03/09/2017	31	3.37581	660.5	20.641	3.087	3.4	3.25	3.063
106.74000	02/06/2017	27	3.95333	662.0	23.643	3.536	3.849	3.699	3.64
141.68000	01/10/2017	34	4.16706	968.5	27.671	4.139	4.451	4.302	3.854
84.19000	12/07/2016	33	2.55121	427.5	12.574	1.881	2.193	2.044	2.238
46.67000	11/04/2016	28	1.66679	216.0	7.448	1.114	1.427	1.277	1.354
16.51000	10/07/2016	28	0.58964	91.0	3.138	0.469	0.782	0.633	0.277
7.60000	09/09/2016	30	0.25333	11.5	0.371	0.055	0.368	0.219	-0.06
9.77000	08/10/2016	33	0.29606	0	0.00	0	0.313	0.163	-0.017
12.00000	07/08/2016	30	0.40000	50.0	1.613	0.241	0.554	0.405	0.087
26.13000	06/08/2016	33	0.79182	82.5	2.426	0.363	0.676	0.526	0.479
28.60000	05/06/2016	28	1.02143	160.0	5.517	0.825	1.138	0.988	0.709
57.83000	04/08/2016	30	1.92767	317.0	10.226	1.529	1.842	1.693	1.615

Post Install Data

Usage	Date	Days	Avg Usage	HDD Sum	HDD Avg	Predicated Usage	Predicted+Intercept	Predicted-Slope	Usage-Intercept
52.77000	04/06/2017	28	1.88464	372.0	12.828	1.461	1.583	1.469	1.763
26.71000	05/08/2017	32	0.83469	281.0	8.515	0.97	1.092	0.978	0.713
7.67000	06/08/2017	31	0.24742	119.0	3.719	0.423	0.546	0.432	0.125
12.02000	07/07/2017	29	0.41448	26.0	0.867	0.099	0.221	0.107	0.292
7.65000	08/08/2017	32	0.23906	0	0.00	0	0.122	0.008	0.117
5.42000	09/07/2017	30	0.18067	0	0.00	0	0.122	0.008	0.059
10.99000	10/06/2017	29	0.37897	103.5	3.450	0.393	0.515	0.401	0.257
32.57000	11/03/2017	28	1.16321	325.5	11.224	1.278	1.4	1.286	1.041
66.96000	12/06/2017	33	2.02909	528.5	15.544	1.77	1.892	1.778	1.907
84.54000	01/08/2018	33	2.56182	782.0	23.000	2.619	2.741	2.627	2.44
64.86000	02/06/2018	29	2.23655	467.0	15.567	1.773	1.895	1.781	2.114
74.76000	03/07/2018	29	2.57793	658.5	21.950	2.499	2.621	2.507	2.456

Nexant is currently addressing the measure life data and plans are to restart the eM&V analysis in late 2020. EE has assigned an analyst to the eM&V Phase 1, who will build

on the work done by the intern. Phase 1 results are expected to be available in Q1 2021.

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 WIP 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 the projected annual therm savings of the measure(s) x 100% of the Avoided Cost per therm. In an update effective on July 22, 2020, Cascade clarified the language in Tariff 301 to indicate that the Avoided Cost per therm is based on the Company's most recently acknowledged IRP. This is consistent with WIP rules and Company practice.

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 designed to bridge the gap between the avoided cost payment and the total installed cost of the approved weatherization measure. Installed cost includes incidental repair work necessary to the installation of a qualified measure. A memorandum of understanding with an estimated 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, eliminating the previous cap of $10,000 per-project and adding a project coordination payment representing "a maximum program average of 15% of the total project cost as billed to the Company." An additional agency indirect rate in the amount of 10% of the total project cost as billed to the Company was also added per the terms of the Company's rate case settlement agreement[6].

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

[6] Washington Utilities and Transportation Commission Docket UG-152286; General rate case on behalf of Cascade Natural Gas Corporation

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

Measure	Avoided Cost per Therm
Ceiling Insulation	$24.85
Wall Insulation	$24.85
Floor Insulation	$24.85
Duct Insulation	$24.85
Duct Sealing	$7.12
Infiltration Reduction	$7.12
Water Heater Insulation	$9.93
Low-flow Faucet Aerator	$5.42
Low-flow Showerhead	$5.42
Natural Gas Furnaces (≥ 95% AFUE) *	$9.93
Furnace Tune-Up and Filter Replacement	$5.42
Direct Vent Natural Gas Space Heater (≥ 90% AFUE)	$11.04
Natural Gas Water Heater (≥ 0.91 EF tankless)	$9.93
Natural Gas Water Heater (≥0.64 EF storage)	$6.55

*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 WA Department of Commerce Policy 5.2.7-SF Deemed Measures Priority List. The Deemed Measures list was initially put in place by Commerce to ease costs associated with the State's Prevailing Wage application to low-income weatherization. The most recent version of the Priority List was published on March 16, 2020 and replaces the original Priority List which was discontinued on Feb 2, 2020. The new list may be used with projects funded strictly with non-Department of Energy (DOE) funds including Cascade and Low Income Home Energy Assistance Program (LIHEAP) monies. Projects that include DOE funding may

not use the Deemed Measures Priority List.

Cascade will stay apprised on the development of additional options for DOE SIR documentation for single-family units (such as Snugg Pro); and the allowance of additional flexibility for complex multi-family projects that do not use DOE funds. The Company will adjust Tariff 301 accordingly as new valuation methodologies are integrated at the state and federal level.

Overall, the WIP/EWIP program is operating as intended, with increased engagement by the agencies that deliver weatherization services in Cascade's service territory. However, participation has slowed in light of COVID-19 as temporary restrictions on gatherings and business operations were put in place by the Governor during the first half of 2020, and agencies took necessary precautions to protect their clients and staff. Cascade agrees that health and safety is the number one priority for our Company, partners, and community.

In the meantime, Cascade continues to actively engage with its CAG, the Department of Commerce, the Energy Project, and the agencies delivering the WIP/EWIP program. The Company is committed to maintaining strong support of natural gas weatherization efforts in these uncertain times and to providing timely reimbursements to agencies currently completing and submitting qualified weatherization projects.

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.

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	28	5181	$234,667.00	$8,380.96	$18.77
2019	66	13,416	$910,314.00	$13,792.63	$30.98

Preliminary findings for the 2020 Program year are as follows:

Approximately **40** projects were submitted as of October 1, 2020, representing a preliminary estimate of **8,655** therms saved and **$596,037** paid out to agencies through combined WIP and EWIP monies. Approximately $15,000 per project was provided on average this year. The minimal variance in participation from the October 2019 YTD achievement of 44 homes reflects the partner agencies' perseverance facing the challenges experienced by all industries in light of COVID-19. Cascade anticipates as agencies and communities adapt to evolving circumstances, the Company will continue to see upward momentum through the program.

As noted, per-project spending continues to increase. Cascade will monitor this trajectory and will work with its agencies and program advocates to determine if further review and discussion is necessary. However, 2020 has been an atypical program year, so this further spike in costs could be a function of temporary challenges. It is promising that the amount of therms saved per home has increased, demonstrating that recent project costs may also be a function of deeper efficiency measures performed by the agencies.

Cascade intends to meet with the agencies virtually by the end of CY 2020 to determine any program adjustments that could help maintain program momentum in light of COVID-19 and other changing circumstances. The Company will also explore the inclusion of additional measures that are periodically completed by agencies, but do not

explicitly qualify for incentives, such a boilers.

The Company appreciates its weatherization partners and is committed to continuing to work with the agencies and the Energy Project to ensure weatherization services are available to all who qualify.

Targets Developed through LoadMAP

Cascade is providing targets for its conservation potential based on the inputs used for the 2020 IRP based off Phase 1 of the 2020 CPA, including limited updates to the measure libraries. The administrative costs have been updated and are based on 2021's estimated budgets and expected contracts. The rest of the model inputs will be updated within Phase 2 of the CPA and will be filed with the Commission in summer.

Projected achievements are based on the Company's best estimates of its UCT 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 reach the Achievable Economic goals.

4.1 CY 2021 & 2022 Targets

The Company has included the most up-to-date Achievable goals as per the LoadMAP model for 2021 and 2022 based on Phase 1 of the CPA. The model will be updated within the first 6 months of 2021 to support improved modeling in the 2022 Biennial Conservation Plan.

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 as well as economic repercussions from COVID-19.

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 2021 as a reflection of the 2020 IRP input updates and to position the Company to adapt to 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 EE Program targets for CY 2021 are more aggressive than those set for 2020, a result of the updated discount rate and avoided costs incorporating a 2.5% Social Cost of Carbon (SCC). The 23% decrease in discount rate and $0.30/therm increase in Avoided Cost are the key drivers behind what is slightly more aggressive than predicted in LoadMAP during the 2019 forecast. Furthermore, for the C/I program, higher level administrative costs, while an attempt to better assure and raise therm savings through increased outreach and altered contracting, impacts both cost-effectiveness and potential.

Figure 9 shows the biennium historical performance and short-term forecast while Figure 10 demonstrates the recent annual program performance and short-term annual forecast.

Figure 9: Incremental Portfolio Biennium Goals

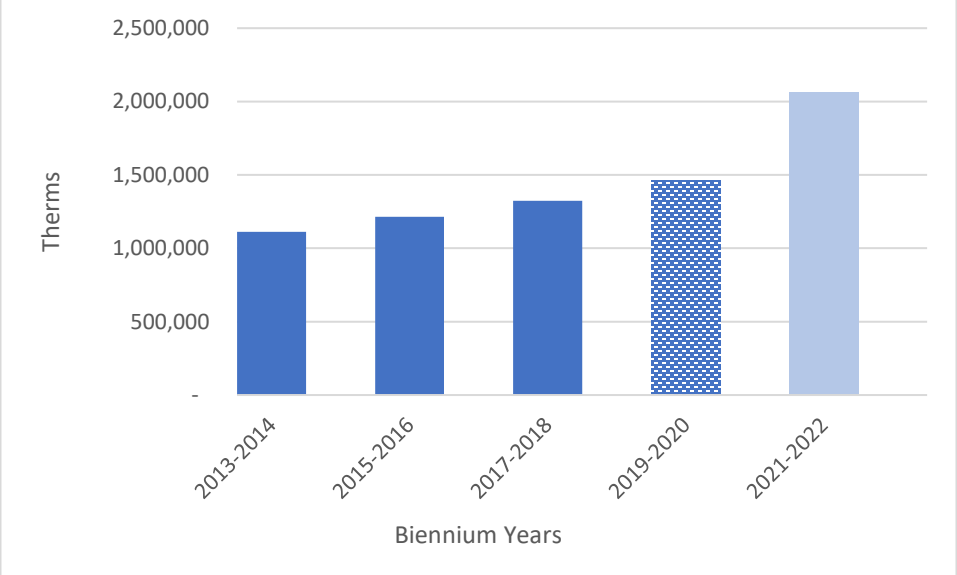
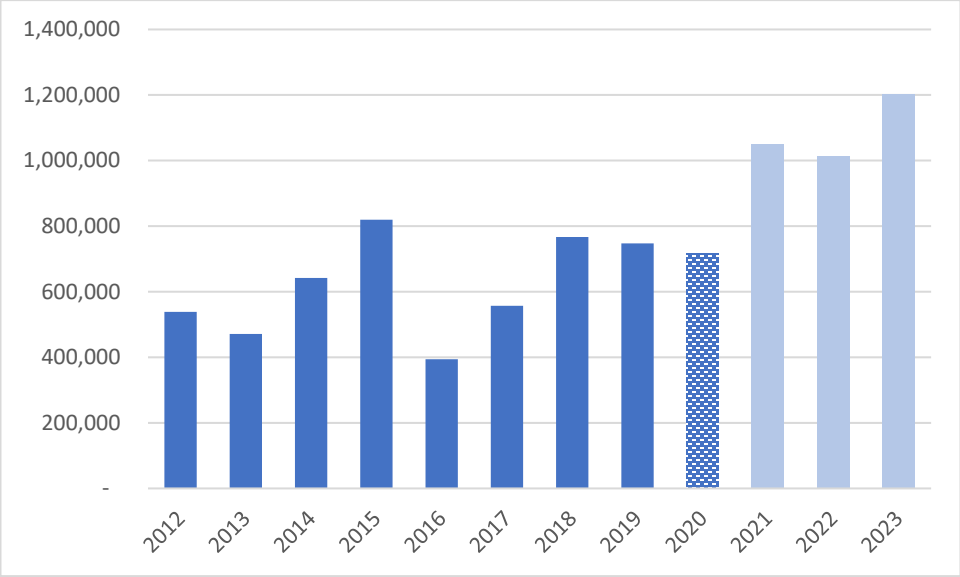


Figure 10: Incremental Portfolio Annual Goals



For this forecast, the AEG CPA estimated energy efficiency savings developed into three types of potential: Technical potential, Achievable Technical and Achievable Economic potential (UCT & TRC). 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 model, 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."*[7]

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 customer and demand forecasts, IRP long term discount rate, transmission loss rate and

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

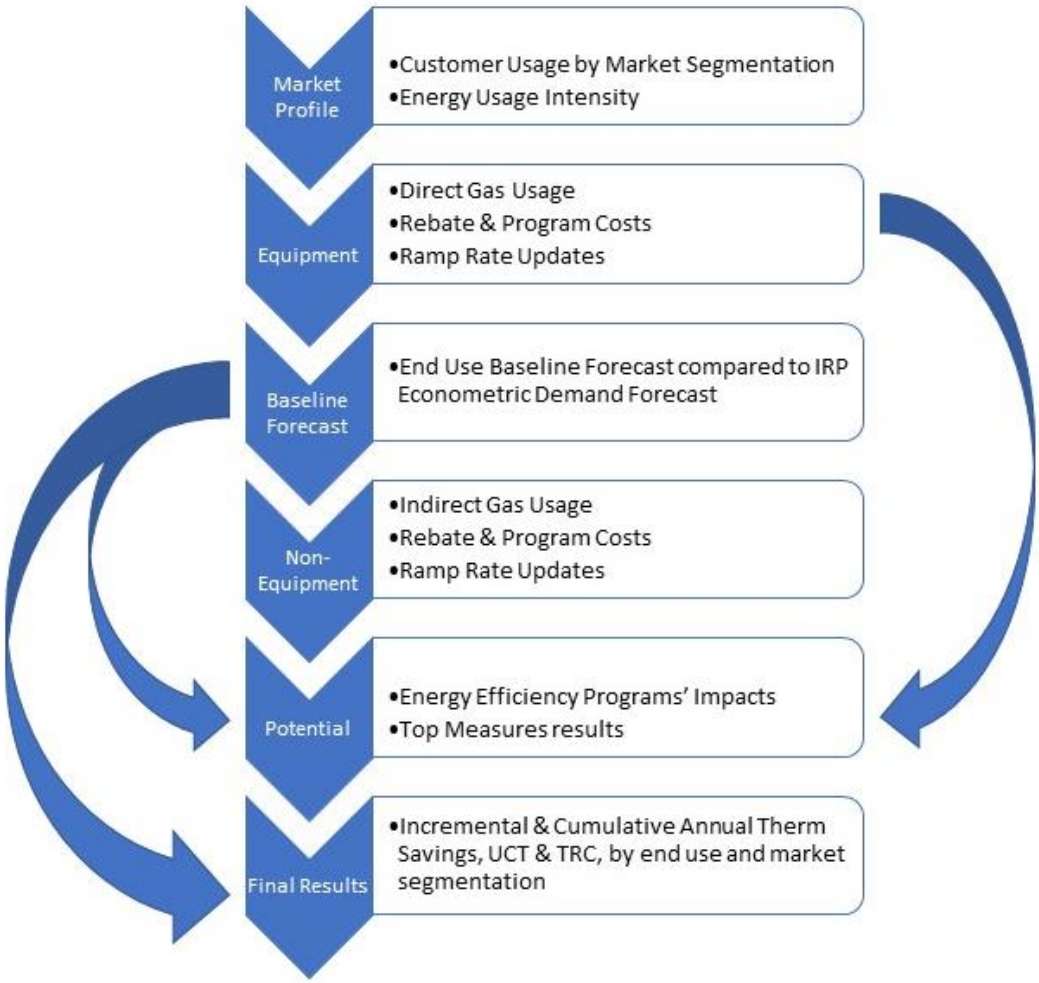
Avoided Costs as well as 2019 annual program performance and measure data collected through energy efficiency applications to establish incremental costs reflective of service territory. This model provides transparent assumptions and calculations for estimating market potential.

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. 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 nuanced and manageable method to developing its portfolio, although it's important to note not all variables are incorporated into the model (the present pandemic as a prime example). Figure 11 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 11: 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 Phase 1 of the CPA's 2019 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 run concurrently 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 2020 IRP within Section 5, were developed into new Avoided Costs and LoadMAP was re-run with these scenarios in mind.

On September 12, 2019 the WUTC adopted Social Cost of Carbon (SCC) estimates from Docket U-190730. Per these guidelines the Company incorporates a SCC through its avoided costs of 2.5% into the Conservation plan and will monitor and incorporate changes to the SCC within the 2022 Conservation plan through the updated Avoided Costs developed for the 2020 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 C/I 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 portfolio of offerings.

Below is a summary of the other model inputs, within the 2020 IRP:

- Inflation rate at 2.00%
- Transmission Loss rate at 0.2479%
- Long-term discount rate at 3.4%, 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 as 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 C/I 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 updated and with 2019 per Phase 1 of the 2020 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 2021 through 2040, for the 20-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 12 provides the Residential cumulative potential, with outcomes by Climate Zone reflected in Figure 13.

Figure 12: Cumulative Potential Forecasts for Residential

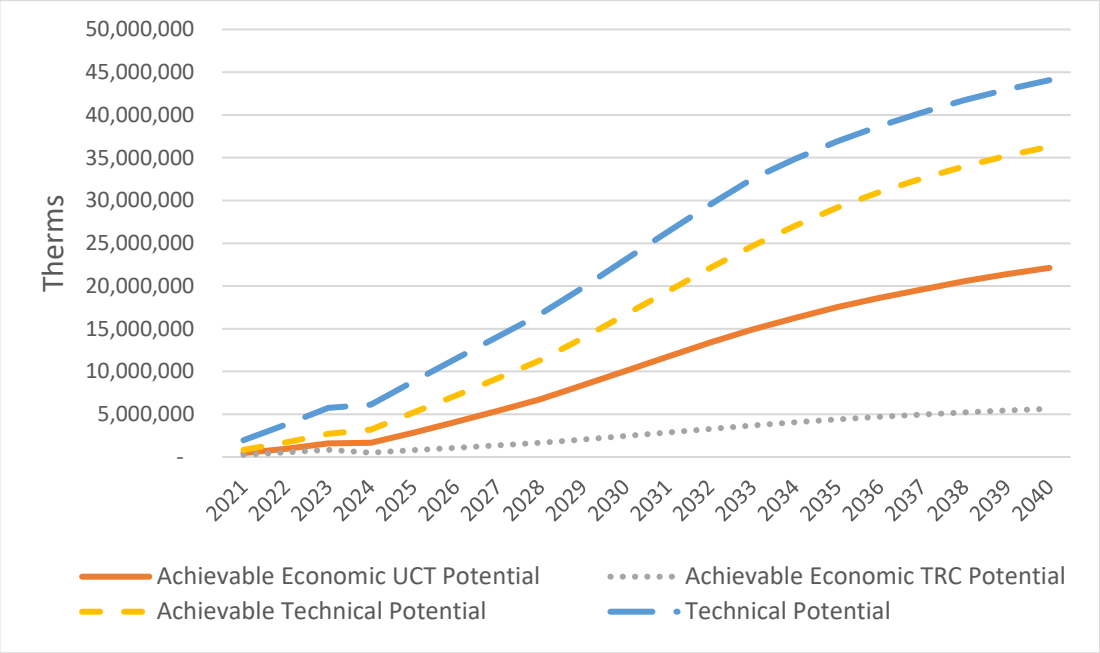
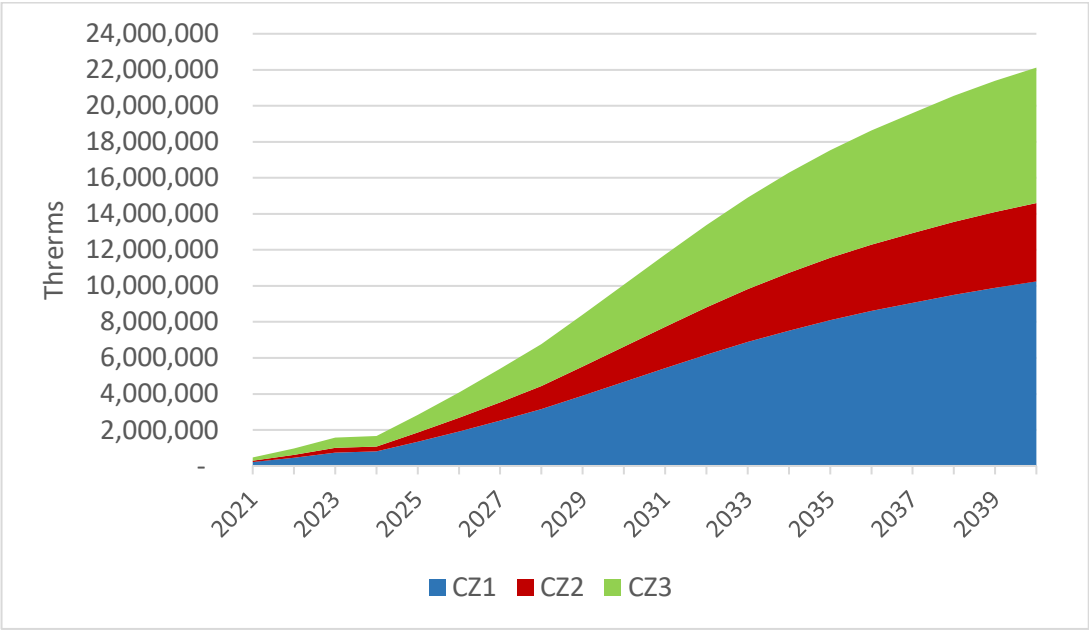


Figure 13 shows the Residential portion of the DSM forecast, split by climate zone.

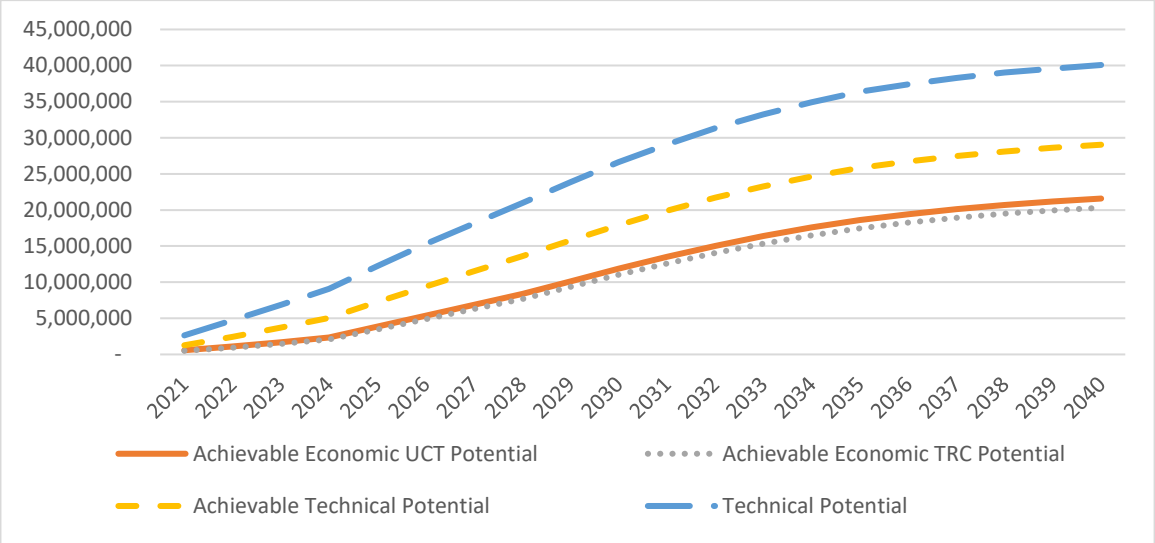
Figure 13: Residential Cumulative Achievable Economic UCT Potential by Climate Zone in Therms



4.6.1 Commercial/Industrial Scenarios

Figure 14 shows the cumulative DSM forecast for the C/I sector by Technical, Achievable Technical and both UCT/TRC Achievable Economic Potentials.

Figure 14: Cumulative Potential Forecasts for C/I



It is important to note the screen conducted with the LoadMAP tool and internal valuation mechanisms for the C/I 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 2020 has experienced a change in prescriptive to custom proportions, and is currently tracking above 90% prescriptive, assuming the large individual custom project mentioned early is tracked in 2021

4.6.2 Combined Residential and C/I Portfolio Potential

Figure 15 shows the cumulative DSM forecast by Technical, Achievable Technical and both UCT/TRC Achievable Economic Potentials.

Figure 15: Portfolio Cumulative Potential by Forecast

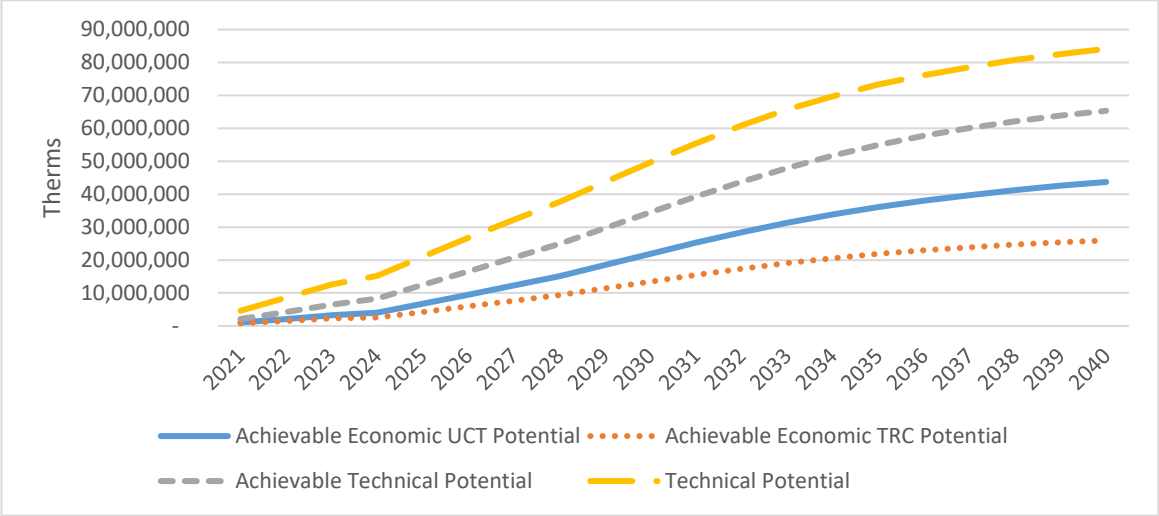
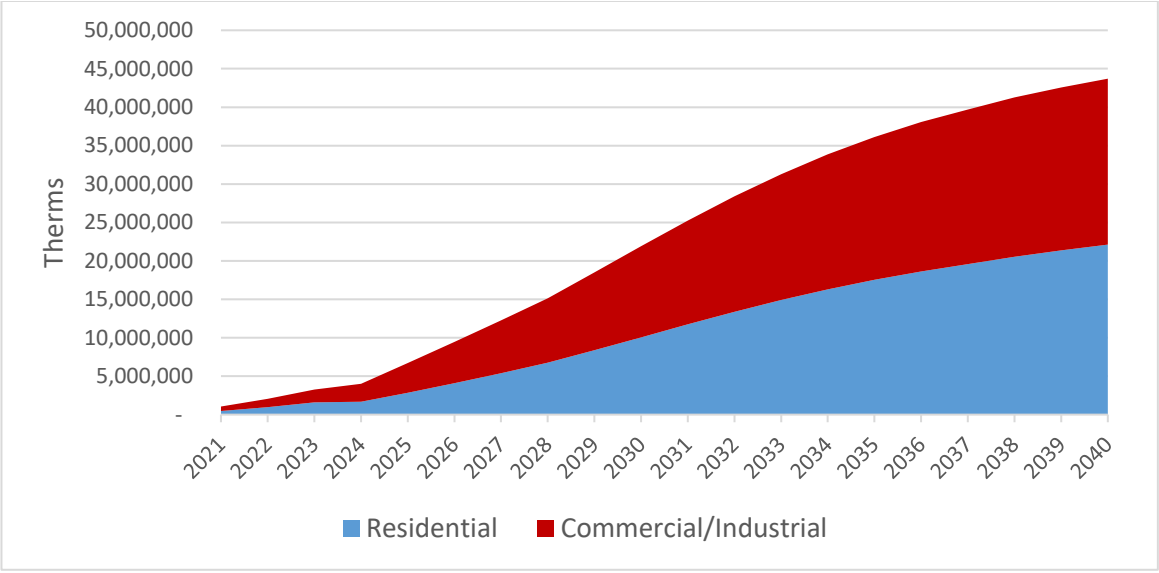


Figure 16 provides cumulative Residential and C/I UCT Achievable Economic Potential.

Figure 16: 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				
2021	471,164	578,483	471,164	578,483	263,853	502,327	263,853	502,327	1,049,647	766,180	1,049,647	766,180
2022	504,604	509,641	974,111	1,085,828	269,611	434,339	532,719	935,062	1,014,245	703,950	2,059,939	1,467,781
2023	608,734	594,290	1,578,956	1,674,192	302,506	517,657	833,344	1,448,182	1,203,025	820,163	3,253,148	2,281,526
2024	556,745	698,695	1,664,485	2,363,043	148,221	619,360	511,912	2,059,860	1,255,440	767,581	4,027,528	2,571,771
2025	1,196,694	1,521,963	2,844,476	3,867,711	287,341	1,415,410	794,225	3,461,484	2,718,657	1,702,751	6,712,187	4,255,709
2026	1,271,344	1,537,101	4,088,454	5,370,054	296,470	1,432,791	1,083,125	4,867,650	2,808,444	1,729,261	9,458,508	5,950,775
2027	1,344,289	1,549,279	5,395,325	6,864,649	305,309	1,447,883	1,378,756	6,273,880	2,893,568	1,753,193	12,259,974	7,652,636
2028	1,416,225	1,565,833	6,764,328	8,362,413	314,057	1,466,643	1,681,448	7,686,177	2,982,058	1,780,700	15,126,741	9,367,625
2029	1,696,263	1,846,250	8,393,160	10,115,712	391,959	1,742,388	2,060,276	9,352,963	3,542,514	2,134,348	18,508,872	11,413,239
2030	1,746,689	1,858,213	10,067,040	11,859,230	418,404	1,756,832	2,463,959	11,015,824	3,604,902	2,175,236	21,926,270	13,479,784
2031	1,762,499	1,798,472	11,743,786	13,515,456	431,033	1,701,269	2,878,826	12,599,117	3,560,971	2,132,303	25,259,241	15,477,943
2032	1,721,308	1,677,624	13,372,059	15,038,830	429,484	1,585,695	3,291,049	14,057,449	3,398,932	2,015,179	28,410,889	17,348,498
2033	1,634,697	1,533,962	14,908,466	16,386,460	415,803	1,448,044	3,688,936	15,347,781	3,168,658	1,863,847	31,294,926	19,036,717
2034	1,471,706	1,382,520	16,283,004	17,578,046	390,548	1,302,677	4,061,285	16,489,302	2,854,226	1,693,225	33,861,051	20,550,587
2035	1,336,881	1,245,416	17,526,175	18,598,487	355,025	1,171,477	4,398,513	17,465,961	2,582,297	1,526,502	36,124,662	21,864,474
2036	1,189,677	1,108,467	18,628,570	19,418,437	322,290	1,039,394	4,703,696	18,249,445	2,298,143	1,361,684	38,047,006	22,953,141
2037	1,044,140	1,033,599	19,593,238	20,114,312	289,474	969,176	4,976,955	18,914,318	2,077,739	1,258,650	39,707,550	23,891,273
2038	1,034,160	948,089	20,549,194	20,707,027	257,460	886,287	5,219,164	19,479,536	1,982,249	1,143,746	41,256,221	24,698,701
2039	902,348	983,163	21,381,778	21,190,089	231,347	923,625	5,436,371	19,939,023	1,885,511	1,154,972	42,571,867	25,375,394
2040	796,499	920,756	22,120,024	21,585,060	218,132	862,673	5,641,270	20,312,148	1,717,255	1,080,805	43,705,084	25,953,419

*Note: the company is working with AEG for updates to the LoadMAP model to address the savings shelf observed in 2025.

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 TAs 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 2021-2024. Furnaces have historically made up half of annual therm savings (insulation another quarter, TWHs 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, the RTF and joint utility program efforts and messaging.

5.1 Regional Technical Forum

The RTF is a technical advisory committee established in 1999 to develop standards to verify and evaluate energy efficiency savings. Cascade's Washington participation in the RTF moves into its second year of membership with a funding share mirroring it's NEEA apportionment at 3.11% of $1.8M prorated over five years. The budget allows funding to roll over from year-to-year with a true-up at the end of the five-year period, with fund tracking reported annually to funders.

RTF develops a work plan for the year that lays out the generalities based on anticipated needs, but as discussed in RTF Policy Advisory Committees there is flexibility built in to shift work around to meet regional needs. The RTF 2021 Work Plan is assuming updates to 10 existing dual fuel measures where they will add and/or expand gas analysis. They are also estimating adding an additional two dual fuel measures and two gas only measures. The specific measures have yet to be determined, however likely candidates are based on measures in their queue including cellular shades, demand control ventilation, tankless water heaters, gas furnaces and/or gas cooking equipment. Existing measure work for the RTF is based on sunset dates, which are changeable.

Based on the 5-year business plan 2022 is less certain, however they are anticipating updates to five existing measures that have gas and the addition of four new measures with gas. They will work with the Gas Subcommittee to prioritize efforts.

5.2 NEEA Natural Gas Regional Market Transformation

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 the 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 alliance 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."[8] Additionally, NEEA serves an integral role in evaluating feasibility and accessibility to a number of natural gas products that had initially seemed more viable than is currently available in the market. While proving a negative may appear counterproductive, these discoveries from the alliance help steer efforts towards the more practicable opportunities for improvement and expansion.

NEEA's natural gas funders meet 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 Cycle 6.

NEEA's efforts in Cycle 6 (2020-2024) are planned as follows:

- Efficient Rooftop Units (RTUs) – This program has evolved from focusing just on condensing RTUs to include other efficient RTU opportunities. 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 2022.
- 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 2021 or 2022 (once a product is close to commercialization).
- 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 2021.
- Gas Combination Space and Water Heating (Combi) Systems – The alliance will continue scanning activities in 2021-2022, with several technologies and system tests.

The Company looks forward to continuing throughout Cycle 6 as a member of the NEEA Board of Directors. Cascade's participation on the Board of Directors allows for an inclusive approach to market transformation from electric only, gas only and dual fuel funders actively engaging alongside representatives from public interest groups, energy service professionals and regulators.

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

5.2.1 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**. 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. The reimbursement from cycle 5 totals $442,490 and is credited to the Company on a quarterly basis through Q3 2022 at $55,311.25 per quarter. CNGC lists NEEA participation in the Annual Conservation Report and will represent the program's cost-effectiveness primarily without the NEEA efforts, due to the absence of significant initial therm savings inherent in efforts of this nature in market transformation. 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**

*Note Cascade pays quarterly - Q4 2020 through Q3 2022 will be at reduced rates due cycle 5 credit

Cascade's participation with the Alliance 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. See

Appendix A for a snapshot from the 2020-2024 NEEA Business Plan for planned Natural Gas program activities.

5.3 Housing Stock Assessment Review from NEEA

Cascade continues to participate with NEEA on Regional Building Stock Assessment reports. These assessments characterize the existing building stock to account for regional differences such as climate, building practices and fuel choices and are frequently referenced in EE program CPAs. The NEEA 2020 – 2024 Business Plan is the first cycle that gas funding is specifically supporting the stock assessments.

The Commercial Building Stock Assessment (CBSA 4 2019) that Cascade contributed to was published in May of 2020. Data was collected through on-site assessments, interviews with building staff and utility energy consumption data. Through the assessment 932 commercial building site visits were completed covering 12 building types.

The company continues to collaborate with NEEA's building stock assessments through the Residential Building Stock Assessment 2022 (RBSA 2022). The RBSA 2022 will assess the energy use and building features of single and multi-family residences in the northwest region with a focus on multi-family units and heating zone 2 (US Climate Zone 5) building stock. The workgroup found data in these areas lacking from previous iterations and by focusing on more of the northwest region in entirety rather than primarily western WA, it would provide a more accurate scope of the region's building stock. Cascade supports this direction, as more data in heating zone 2 (aligning with the eastern WA sub-region) will contribute to better serving Cascade's zone 3 territory. The company is also exploring ideas for expanding multi-family incentives so more data on these units could benefit the program design.

According to the RBSA 2022 Workgroup[9],

1. This study will focus on comparability and transparency around data element additions, deletions, and modifications
2. This study will focus on improving representativeness through sampling and recruiting approaches. No attempt will be made to ensure comparability between analytical results from previous studies
3. This study will not include long term monitoring
4. The study will collect energy consumption data on single-family residences and

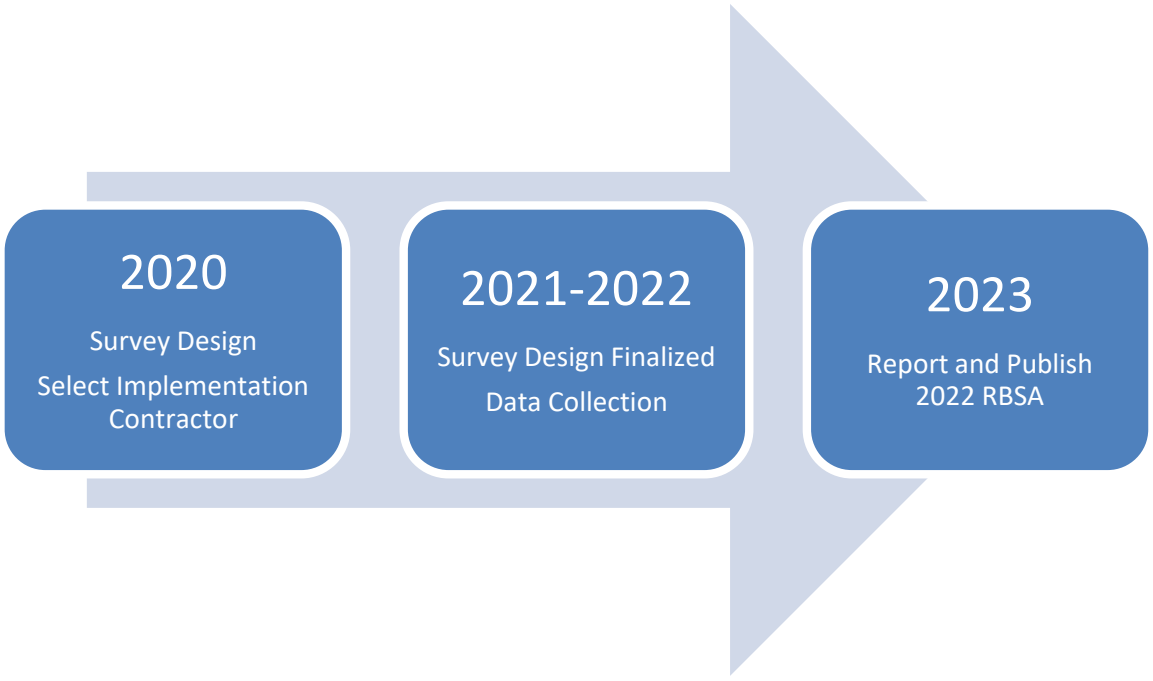
[9] NEEA Residential Building Stock Assessment 2022 Workgroup Meeting: 9/23/2020 published notes

multi-family units

5. Analysis of billing data will produce monthly weather normalized energy consumption, and annual heating load estimates
6. Model fit statistics associated with analysis of billing data will be reported
7. This study will include the seven BPA sub-regions in the sample design
8. Study deliverables will include both a database and analytical tables that consolidate some variables from the database
9. Utility oversample will be included in the final database and integrated into the sampling plan and weighting scheme

While a few other utilities opted to pay for additional survey sampling in their service territory, the Company has opted not to oversample in RBSA 2022. Since, this is the first version with natural gas company contributions, it seemed prudent to monitor how natural gas use and products are incorporated into the survey and data collection. See Figure 17.

Figure 17: RBSA 2022 Timeline



The RBSA workgroup began meeting in July of 2020 to design the third iteration of the survey. A Request for Proposals was released in October 2020 to hire an implementation contractor to start design and data collection in 2021. Different from previous years, the Request for Proposal responses need to include COVID-19 measures such as

alternatives to onsite inspections if Stay Home, Stay Safe rules continue including increased safety steps for technicians.

The awarded contractor will collect data through customer surveys and site inspections through 2021-2022 pertaining to building envelope, home and water heating fuel source, heating and cooling equipment, appliances, plug load, and lighting to determine existing conditions, potential trends, and market transformation opportunities. Analyses of the data collected will also contribute to the Company's CPA, IRP, and load forecasting.

Due to the uncertainty of COVID-19, the RBSA workgroup is currently proceeding as originally planned and following the original timeline. However, it is considering flexibility for potential unforeseen disruptions such as the inability to physically visit sites, delaying or prioritizing regional areas based on COVID-19 surges, or resident nonparticipation due to the pandemic. Although, some information can be gathered by phone or online from residents, they can be unreliable sources for detailed technical data.

If the RBSA 2022 can stick to the current forecasted timeline, the survey should finish in 2022 with the final report published late 2022 or early 2023.[10]

5.4 NEEA Residential New Construction

In late 2018 NEEA's gas funders agreed to support 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 2020 NEEA expanded its goals from supporting utility awareness, education and understanding, and improving coordination and regional alignment of programs to include a more direct connection to code advancement and accelerating the adoption of Zero Energy Ready (ZER) homes and efficient technologies used to achieve ZER homes. NEEA developed and delivered new technical trainings to support more efficient residential new construction, and integrated gas-focused research and outreach activities through its BetterBuiltNW platform to expand natural gas opportunities. NEEA also provided information on upcoming code changes in WA that could affect the Company's residential rebate program. Cascade remains interested in exploring additional leveraging opportunities with the NEEA new home programs.

[10] https://neea.org/img/documents/Q4-2020-MRE-Newsletter.pdf pg 18

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 and 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 EEIP to Cascade customers. In addition to the integrated marketing approach, the Company also employs a cross channel marketing practice where the customer chooses their medium and can use their preferred method to interact with Cascade's programs. Cascade 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. In 2020 the Company had to adapt from an in-person outreach approach to a fully remote method through social media and available partner websites. Ultimately, the Company tries to keep its energy efficiency message useful and, impactful to its audience. For instance, the Company provides messaging for new tariff releases through bill inserts promoting the change, through advertisements illustrating the message, and call outs on the Company's main website.

Cascade continues to use traditional and increasingly social media sources to communicate with the public. Working with its corporate customer communication department, the EE Department has been able to inform customers of upcoming events and accomplishments in real time increasing the relevance and breadth of the message provided.

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 which will change to an updated version, PUX, in 2021 and through 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 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 Engagement

One area Cascade finds essential to increased program participation and awareness is involvement with local community energy projects and programs. Energy program efforts outside of the Company offerings are a valuable resource for the utility to leverage existing relationships to reach new groups and reinforce the EE message in new ways to existing audiences.

The company continues to partner with regional non-profits as available and intends to expand collaboration with neighboring utilities and agencies. The presence of multiple utilities at outreach events (either virtually or in person) greatly improves customer reception of energy efficient information through program availability. Whether a customer of the Company or another utility, consumers can benefit from information about energy efficient upgrades and rebate availability. Cascade will expand on these collaborations and partnerships in 2021 by cosponsoring events, providing a greater general efficiency message to shared territories and collaborating on regional rebate promotions where efficiency criteria aligns.

Cascade has reached out to two neighboring utilities so far, Avista and PSE, to work towards consistency in methods and products customers receive. The EEIP staff receive customer feedback occasionally when they are confused by differing eligibility criteria

between utilities. In 2021, Cascade will continue to work with Energy Efficiency programs in other utilities to create clear messaging and encourage regional uptake for measures offered by many of the utilities including shell measures or home heating.

The Company is also working with regional utility partners in preparation for the implementation of HB-1257. Cascade intends to standardize (or as closely match as possible) its customer experience and data sharing for energy usage benchmarking with overlapping service territory utilities. As more customers reach out to Cascade for benchmarking data, the EEIP intends to make the experience and requirements consistent for customers as they work with others to track building data.

This outreach to neighboring utilities opens conversations for additional collaborations and sharing of processes to ultimately helping joint customers. For instance, prior to transitioning to a remote work model staff was able to direct transfer customers to other utility EE service lines to avoid the frustration of navigating through phone menus. While this is currently unavailable the program remains open to exploring additional opportunities for parity and improvements to the customer experience.

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 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.

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 integral in providing personal interactions with community members to help them qualify and apply for rebates.

Company staff also 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, participating in events and providing guest lectures as requested on demand side management and efficiency programs.

After the success of Trade Ally partnered radio ads, the Company is continuing to offer this outreach 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. This year the radio ads will provide more time for the TA to provide individual messaging and may expand to include online promotion of the C/I program on the Cascade Radio Group's website.

EEIP staff was able to host two informative district meetings about the EEIP to Company operations staff in Zone 2 before the March 2020 shutdown. The meetings were well received and shed light on common rebate questions and historical changes in the Company's offerings. The discussions with operations staff showed gaps in awareness about the EEIP internally, providing further opportunities for clear understanding and promotion. EEIP staff will resume district meetings in 2021 when in person meetings are deemed safe.

The company intends on continuing efficiency outreach at service area sporting events (which were postponed throughout 2020) such as baseball games in Yakima, Walla Walla, Longview and Bellingham. Partnered outreach messaging on social media platforms and websites will continue in 2021 to maintain a presence until in-person gatherings can resume.

Cascade expanded advertising sources to magazines and playbills in 2020. The Company began advertising in 6 regional magazines in the spring to take advantage of customers spending more time in their homes. The magazines are high-end lifestyle magazines focused on residents in Zones 1 and 3. The Company will continue with these ad campaigns in 2021 and will look to add similar outreach strategies in the coming year. Due to COVID-19, the sponsorship provided to Mount Baker Theater in Bellingham will be applied to the 2021 season.

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 (both in the mail and through online account access) aids program understanding and brings new opportunities to the customer's attention as their needs change throughout the year.

The Company did a general heating efficiency video for an October outreach event and will pursue other educational and outreach videos for its Trade Ally contractors and

customers. The EEIP will increase its online outreach presence as it settles more into a virtual future, with additional social media posts and online event collaborations.

6.2 Residential Focus

Local Home Builders Associations (HBAs) provide another consistent partnership opportunity for energy efficiency messaging. In 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.

In 2020, most HBA's were not able to host their annual Home and Garden shows or Home Tours in person but rather offered virtual tours or postponed in person tours until 2021. Cascade partnered with the HBA's to advertise in their digital directories and on their websites. In 2021, the Company plans on continuing to partner in whichever capacity the HBA's choose to pursue their events, through its prior experience in both in-person and virtual events.

Cascade relies heavily on coordination with local area contractors to encourage uptake of its conservation programs. One on one meetings, similar to those held for the district offices, will occur virtually until it's safe to visit in person. A few contractor meetings will be planned in parity with district meetings as a check-in with Trade Allies and an opportunity to offer process improvements in person. Training and outreach to contractors will continue into 2021-2022 to improve understanding of the EEIP and confirm accurate messaging.

The Trade Ally program offers benefits and advantages to TAs in addition to POS options and training/advertising reimbursements. TA's also receive advertising on the company website and referrals as vetted contractors when staff communicates with customers. Other benefits include technical support as well as special bonus coupons. The coupons are submitted by a customer in conjunction with a qualifying rebate application whereupon funds are distributed directly to the customer. The Company extended the redemption period for the bonus coupons in response to the economic impacts during COVID-19. These coupons encourage TA's to discuss rebate eligible options with customers as opposed to encouraging standard efficiency and can lower up front installation costs.

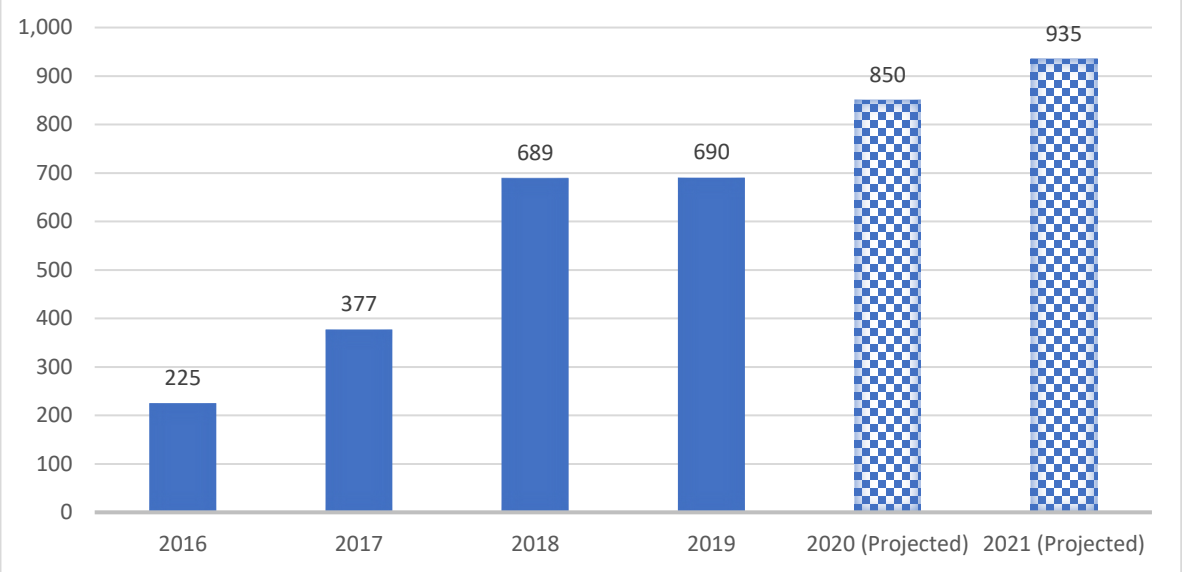
TAs find the bonus coupons one of the most valuable benefits of the Trade Ally program. For reference, through September 2020 the bonus coupon submittals equated to $20,500 additional funds provided directly to customers, directly tied to savings measures, with 49 TAs taking the opportunity to nudge their customers on the fence

about efficiency by encouraging higher-efficiency upgrades.

6.3 Supporting the Builder Cohort

The builder program faced some significant hurtles in 2020. In large part these challenges were from the pandemic's impact on the builder community, resulting in many builders applying for fewer rebates than initially planned. In order to help the builder community, the EE department extended the application deadline out from 6 months, to the beginning of January 1, 2019 for those builders that were unable to apply within the 6-month window required by the program but had constructed the buildings with high-efficiency driving their decisions. In addition to affecting rebate applications, the prolonged quarantine prevented the builder program coordinator from performing in person outreach and training to help builders apply for rebates. However, the program was still able to incentivize many pieces of high efficiency gas equipment for new home builders, see Figure 18 for program uptake comparisons from 2016-2021's projections.

Figure 18: Builder Program 2016-2021



6.3.1 2021 Outlook

The builder program was able to incentivize 445 applications through the end of Q3 2020. Over the previous 3 program years, roughly 50% of builder applications are received in Q4, which suggest that the builder program may receive 850-950 applications. Furthermore, the EE department is expecting 400 applications from Hayden Homes, a large builder in the CNGC service territory that joined the builder

program this year. If the program received 850 rebate applications, it would exceed last year's projection.

In 2021 builders will be facing unique challenges to achieving the energy efficiency credit requirements under section R406 in the Washington State Energy Code[11]. The builder program coordinator is working with builders to understand these challenges, to provide possible solutions that allow builders to use high efficiency gas and meet the credit requirements. For further information on this refer to the emerging technology and building codes section.

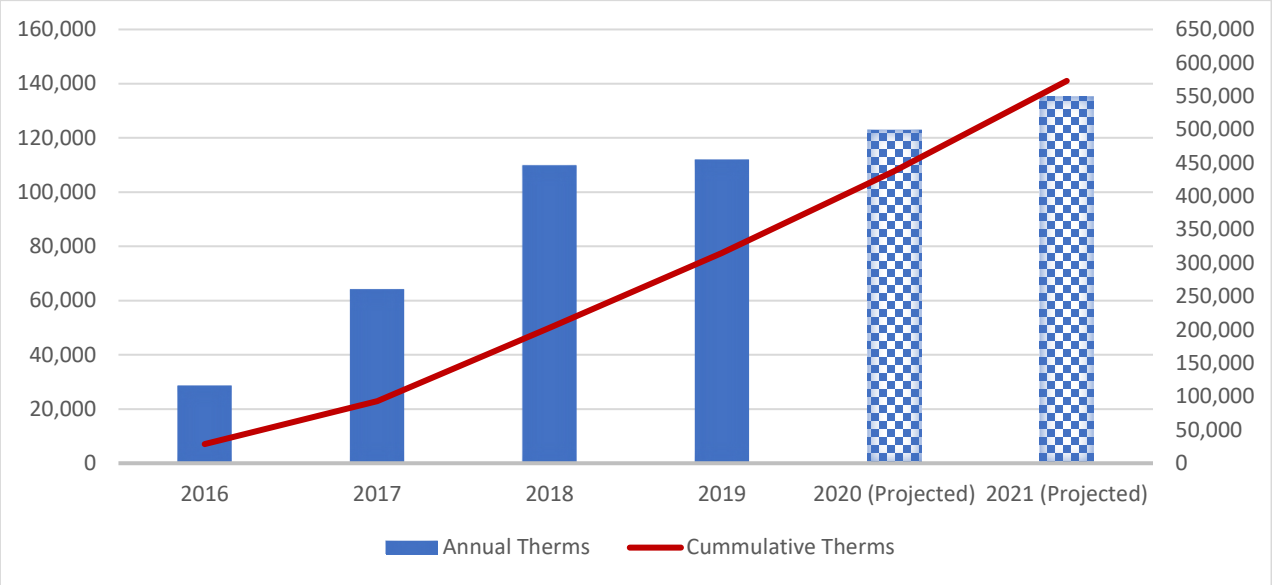
The Company believes responsible growth is possible considering the robust new homes market in some of its territory and is targeting a 10% increase in new home applications submittals for 2021. For that to realistically happen the following will be essential to maintain momentum:

- Consistent expanded efforts for more direct one-on-one outreach with builders; and providing training in one-on-one settings so builders can streamline their application process
- Implement remote solutions for reaching out to builders
- Implement remote inspection software to perform more new home inspections
- Field time to connect with builders in underserved areas travel permitting
- Research high performance building envelopes technologies for incentives
- 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

See Figure 19 for Projected Builder Program therm savings moving into 2021.

[11] https://sbcc.wa.gov/state-codes-regulations-guidelines/state-building-code/energy-code (see R406)

Figure 19: Builder Program Therm Savings 2016-2021



6.4 Low Income messaging opportunities

As per the prior year, Cascade set aside a budget of $20,000 for outreach to the community to generate greater awareness of, and participation in, the Weatherization Assistance Program in 2020. Due to the COVID-19 crisis, requests for outreach were minimal, but Cascade anticipates the desire to promote weatherization services will increase as agencies begin to resume work in customers' homes.

Cascade intends to hold a virtual meeting with agencies within the next six months to discuss opportunities to generate program awareness.

6.5 Commercial Focus

Alongside the residential outreach efforts, Cascade also promotes messaging to C/I customers. Throughout 2020, the C/I outreach team developed four 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. Bill inserts have historically focused on the Residential and Low-Income programs but and the Company is now addressing all eligible customer classes in its EE inserts.

Additionally, the C/I team continues to highlight projects with the highest return on investment potential to promote their accomplishments through case studies and public relation efforts including press releases, media pitches and check presentations.

However, these activities were put on hold in 2020 due to Covid-19. These types of promotions provide a cost-effective venue to achieve press coverage and promote the program through best-practice examples. The C/I team will monitor market conditions and reinstate this outreach model in 2021 when appropriate.

The C/I team plans to highlight EE opportunities to manufacturing, industrial and senior living facilities in 2021 – sectors that have high-potential for growth or may need extra support due to COVID-19 impacts. In its outreach the C/I program plans to highlight radiant heating, insulation and custom measures to increase awareness and drive savings within these targeted sectors. This outreach will include sending program offerings, case studies and a potential bonus opportunity to the targeted sectors to increase project count as direct outreach supports the customer account management approach and engagement strategy by encouraging new and existing customers to take action and invest in their properties.

The C/I team will work with Cascade to implement a TA strategy to recruit new contractors in all service areas. Using the 2020-customer marketing strategy, the team will select 2021 targeted measures and promote these directly to customers and TAs. These TAs will receive tailored messaging from the utility to promote the target technology to help contractors sell the technology, spread program awareness and provide overall energy efficiency education.

C/I attends Chamber of Commerce events including annual and monthly meetings and business expos to distribute both residential and C/I messaging. Due to the pandemic, more and more events are turning virtual and the team will participate virtually and in person as opportunities arise.

6.6 Online

In 2020, the C/I vendor implemented paid advertising campaigns, to drive website traffic and provide customers with even more efficiency information. This included a paid Google AdWords campaign to bring customers to the C/I web pages. The campaigns were effective in raising web page views as seen in Table 14 and Figures 20 - 22 with an increase upwards of 2,300% from 2019.

Table 14: % increase of pageviews from 2019

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
EE: C/I Rebate Offerings	102%	133%	206%	396%	2316%	712%	1435%	47%	-24%
C/I Rebate Application	54%	23%	26%	96%	129%	36%	244%	138%	171%

Figure 20: Pageviews from website: /energy-efficiency/commercial-rebate-offerings

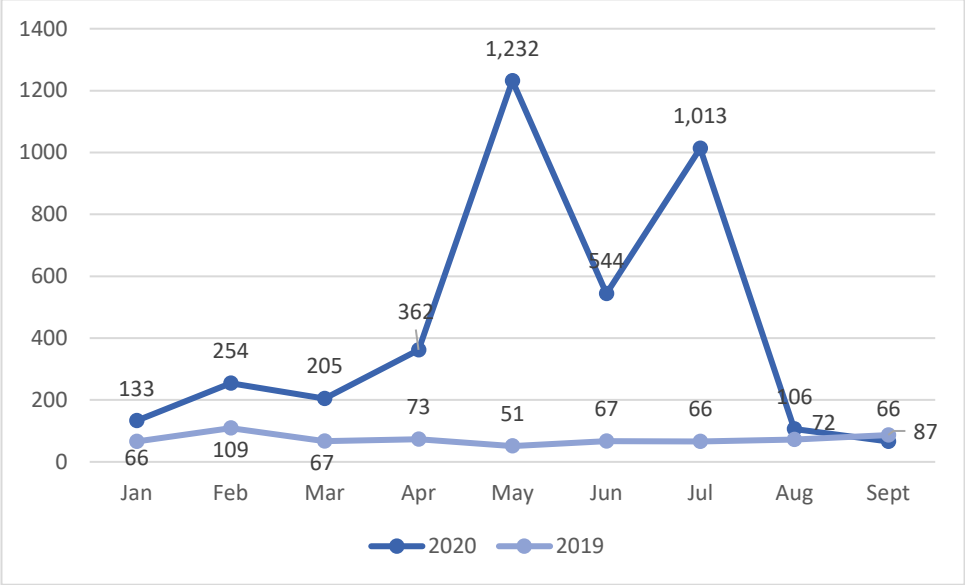


Figure 21: Pageviews from website: /commercial-and-industrial-rebate-application

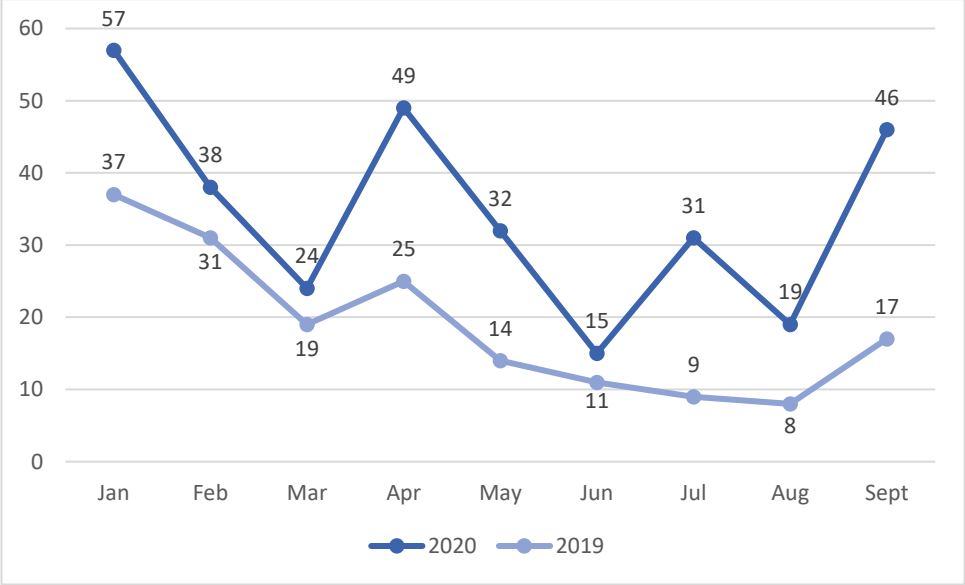
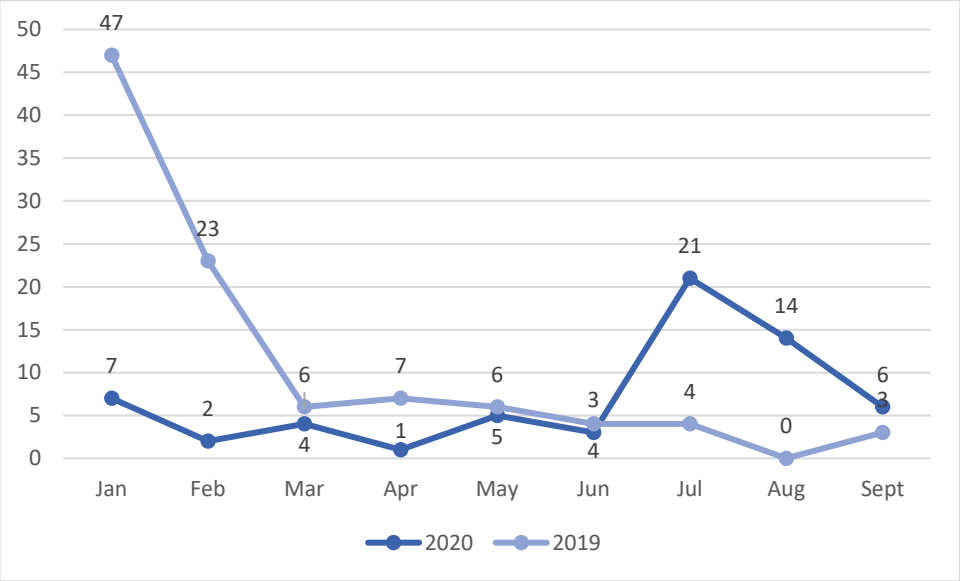


Figure 22: Pageviews from website: /apply-for-an-energy-saving-kit/



2021 Recommendations

In an effort to further refine and improve the customer experience, the C/I vendor TRC Companies, Inc. recommends making the following changes to the Commercial Rebate landing page for easier navigation. Reordering the page would essentially use the landing page as a "program overview" with a high-level summary of the program and quick links to the incentive sheet and application form. From there, the Company could add links or buttons that direct customers to specific technology pages that could host the technology incentive, a specific case study, etc. The C/I vendor also recommends switching the order on the landing page to display WA above Oregon, as well as strategically reordering the WA sections for easier access and visibility.

Future, more involved considerations include:

- Add an "Energy Efficiency Resources" section or new page that could host the C&I case studies and the technology factsheets
- To modernize and improve the user experience best practice is to display relevant information directly on the page and avoid PDFs. Develop a page or tab for each rebate category that would have applicable rebates, factsheets and case studies. This would help with targeted marketing and presenting rebates in a digestible manner. It would also help tracking to see which measures customers are most interested in:

- Heating
- Kitchen Equipment/Appliances
- Weatherization
- Water

The department gained access to track residential Google Analytics during H2 of 2020 and plans to use this service to monitor customer behavior moving forward. This tool provides insight to make internal adjustments to streamline customer processes. Figure 23 displays the pageviews for the residential rebate offerings page. Cascade plans to implement changes so WA customers will not have to scroll on their desktop for the information they need, specifically on this landing page. As of now, customers must scroll completely to the bottom to apply for an application. Instead, Cascade will work with its parent company to have a "ready to apply?" or "apply online" button directly under the Residential Rebates banner on the landing page. This should in return, increase the bounce rate for this page. Currently, customers may come to this page unable to find what they need and leave the site to find information elsewhere.

Figure 23: Website Pageviews H1 2020: /energy-efficiency/residential-rebate-offerings/

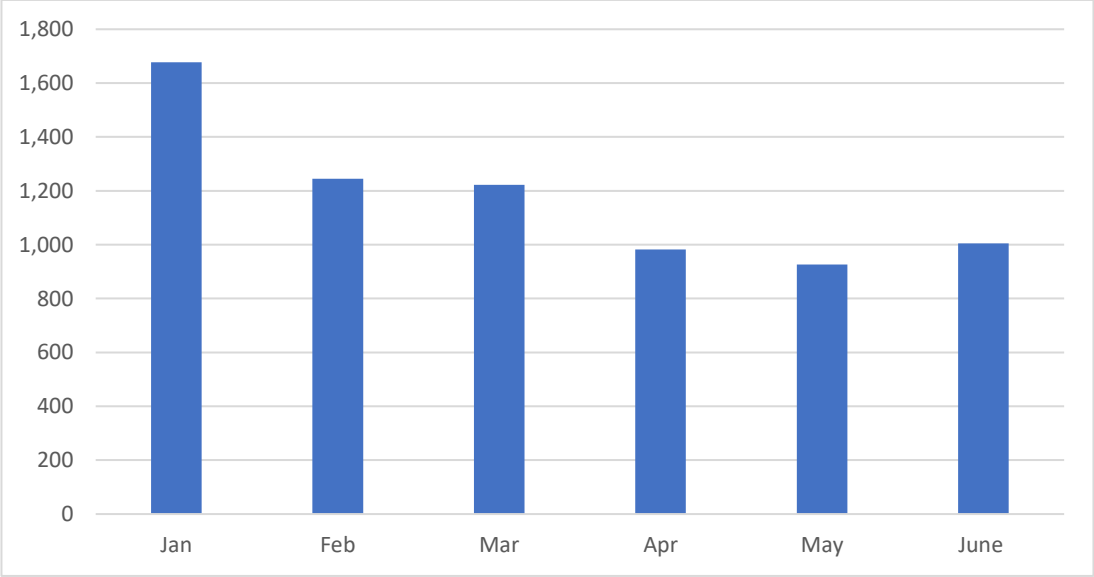
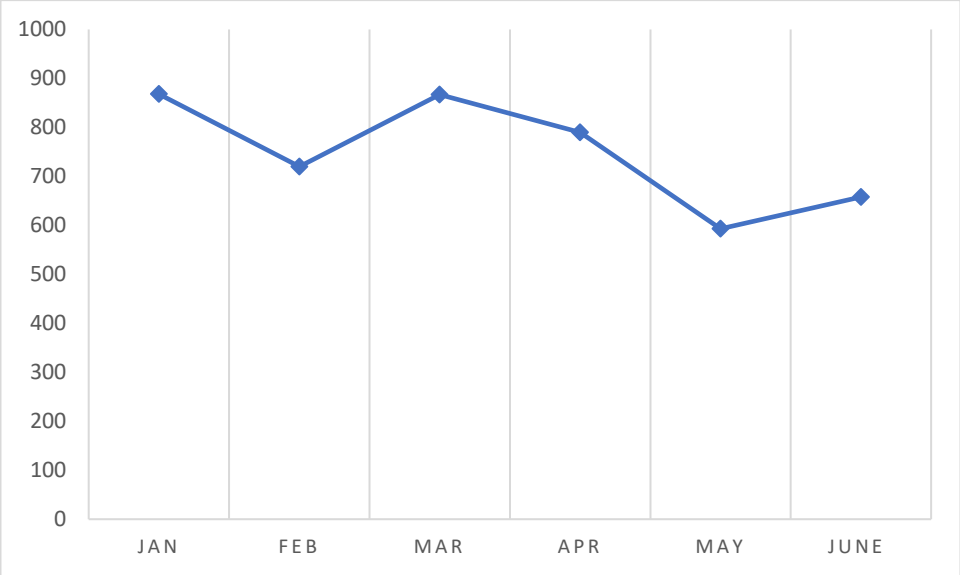


Figure 24 below represents the pageviews for the Energy Efficiency page, which seem to trend similar to what we see with our winter application intake levels. Starting off high in January and reducing as we head into the warmer months.

Figure 24: Pageviews H1: 2020/energy-efficiency/



The Energy Efficiency page also has a bounce rate of 62%, meaning customers either got exactly what they needed by landing on the page, or the site wasn't engaging enough for them to look further. The department intends to make the landing page more interactive, with plans to provide a monthly update of the rebates paid, and other interactive buttons and links which should entice the user to click to read more. Additionally, processers noticed, with the help of the weekly disqualification and missing information report, that furnaces were frequently falling outside the eligibility criteria. In response to this frequent issue the EE department plans to incorporate a caution sign on the website to alleviate confusion on furnace eligibility prior to submission of an application. A link to the AHRI will also be proposed, giving the customers tools to research whether their furnace qualifies. This improvement should cut back on processing time to deny ineligible furnaces.

As more outreach is transitioning to online platforms including home builder sponsorships, Cascade will plan to use buttons and hyperlinks from ads to link directly to the EE website. Direct links cut out confusion as online customers are only one click away from earning an incentive or learning ways to save. Syncing the clicks from an ad to the specific page viewed will provide the department with enough feedback to analyze what messaging resonated with customers and what the Company can build off of to replicate that call to action in future posts.

Having a prominent presence on social media with Trade Allies will also be more important in the virtual realm. The Company will work with contractors to post ads or

articles to their social media pages to broaden the EEIP's reach demographically by exposing existing and potential customers to rebate opportunities.

Lastly, Cascade will research whether the EE program can house its application submittal tool on the same log in page that customers use for bill pay. This streamlining would eliminate the need for users to create a second rebate log in, and would allow them to monitor their monthly bill as well as their rebate status, ultimately improving the overall experience.

6.6.1 Social Media

It's become clear vast numbers of Cascade customers have social media in this day and age, especially as the economy has moved into a "Stay Home, Stay Safe" lifestyle. This makes social media a crucial tool for outreach, like targeting hard to reach areas. The department plans to ramp up EE messaging on social media in the following two years by working closely with its parent company. MDU currently manages the Corporation's social media content, posting energy saving tips or rebate information once a month. During three quarters throughout 2020, EE messaging was published across Facebook, Instagram, and Twitter with the same content for each platform. Throughout 2021 the department will take a strategic approach while collaborating with MDU with a goal of at least one incentive specific ad posted per month, along with reoccurring themes throughout bill inserts and directories to further imprint the messaging of EE. The team will then sync social media posting with the Google Analytics to track user engagement within its website and media accounts. This will allow EE to analyze the behavior of online users, and the team can adjust outreach in real time to accommodate. Table 15 shows what EE messaging has been posted throughout 2020. As noted, the majority of online messaging to date centers on EE tips, Cascade plans to generate monthly incentive messaging and pair it with the relevant energy tips already posted.

Table 15: H1 2020 Social Media Posts

January	February	March	April	May & June
Ad- EE Tips "Caulking and weather-stripping"	Ad - EE tips "Show your furnace some love" furnace filters	Article - Daily World "Nailing Down Rebates" Article - The Northern Light collaboration with PSE Ad- St. Patrick's Day EE tips and rebates	Ad- Earth Day ad rebates and EE tips	None
July	**August**	**September**	**October**	**Nov. & Dec.**
Energy saving costs - appliances	*"Ease the stress" Furnace rebate*	*Ad- Commercial incentives "Rule your attic" ENERGY STAR*	*Ad – "Switch ceiling fan" EE Tips Ad – EE day*	*(TBD)*

6.7 Customer Calls

Cascade continues to track all customer interactions over the phone. At the end of each month, an analysis is sent to the team to see what these customer interactions are like, giving the Company an opportunity to hone in on areas to improve EE communication. This analysis consists of:

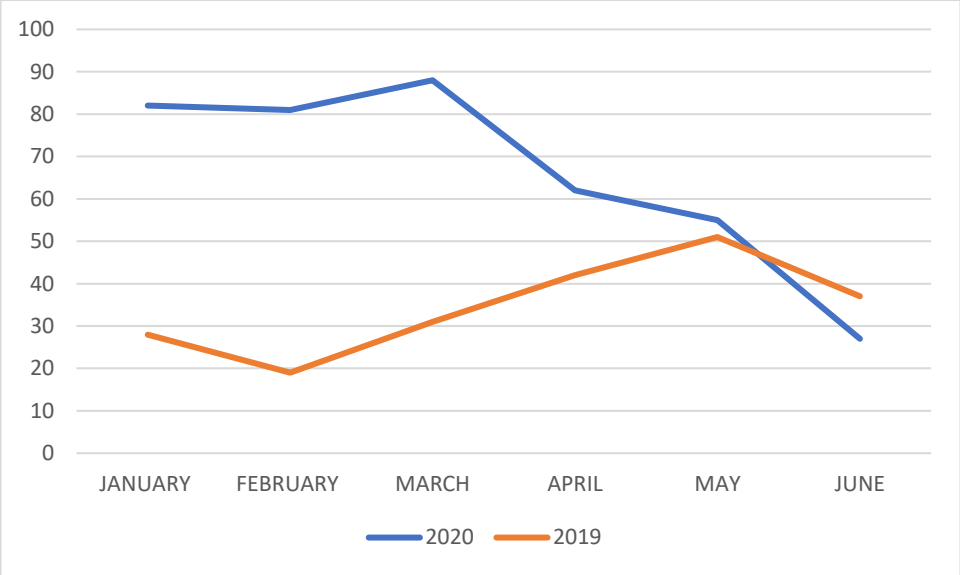
- Pre-Purchase calls – Seeking eligibility requirements prior to purchase or install
- Pre-Application – Questions on whether existing equipment qualifies, or about application submittal processes
- Status – Status update requests on rebate applications
- Transfer – Transferring to correct department ex: Energy Trust of Oregon, Cascade customer call center and TRC Companies Inc. for C/I assistance
- Follow-up – Outgoing calls for missing information and miscellaneous inquiries

The greater part of incoming traffic in 2020 consisted of pre-application calls. Customers may have seen the bill insert, an ad in a home tour directory, or messaging on social media that an upgrade earned them an incentive. This type of engagement is valuable and crucial to providing intelligence on how to spread the word on available rebates early enough in the process to influence purchase decisions. Cascade will continue to seek ways to expand Outreach through consistent social media presence and place ads in hard to reach rural markets.

Status calls continue to peak during the winter season while the queue is higher and slow during the spring and summer. The pandemic has created a unique peak in customer inquiries for those especially anxious about their rebate check, proportionate to the economic impacts of the pandemic. With this increased demand from customer

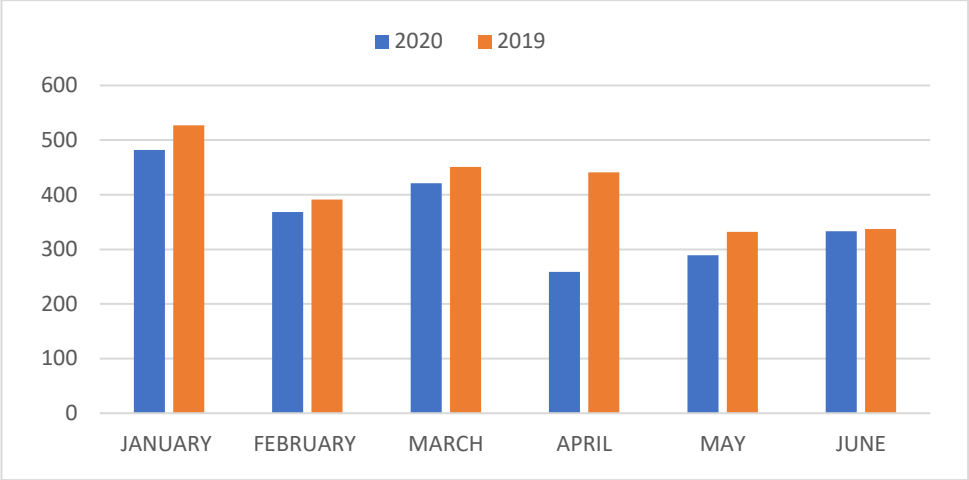
behavior, the team committed to returning status calls within 24 hours and simultaneously focused on processing as many rebates as possible. The team started 2020 off more than doubling the status calls of 2019. The department drove incoming call inquiries down during the transition to working from home, as well as tackled missing information from furloughed contractors. See Figure 25 for a six-month comparison of status calls by volumes.

Figure 25: H1 2020 to 2019 Status Call comparison



In March of 2020 the department transitioned to a remote work model. Due to this transition the EE team is not answering phone calls directly as customers are leaving a message and receiving a call back. As the customer support model has transitioned to a call back format, customers are advised to email inquiries for quicker response times. See Figure 26 for residential incoming and outgoing calls for 2019- 2020. These trends are likely to continue while the pandemic continues into 2021.

Figure 26: Residential Incoming and Outgoing calls Combined



6.8 Business Development Collaboration

Energy Services Representatives (ESRs) provide customers in the field the opportunity to learn about EE before purchase and installation of equipment. These customers fall into three categories as either a Residential customer, Builder, or C/I customer.

For the past two years the EE department used a Feasibility Work Book to identify customers with EE potential. This process was time consuming, requiring staff to weed through 50-150 customer leads daily in search of an indication of interest in energy efficiency. The few customers who then self-identified as interested in EE opportunities would be sent a mail merge letter with an incentive sheet and application.

Because the previous method proved cumbersome and administratively costly the process was altered in 2020. Now the ESR team will email notifications of new service solely for those interested in EE, saving a tremendous amount of time. Because the review process is less cumbersome the EE department is now able to devote that time previously spent weeding through submissions to reaching out via phone to discuss incentives. This method is an improvement by allowing personal communication with these new customers on the phone vs through generic letter. The Company has received positive anecdotal feedback that hearing a representative's voice imprints the rebate information and offerings more fully in the customer's mind as they review their equipment options. Keeping the process simple with the ESR's to begin with has helped transition away from Feasibility Work Books, and aided in strengthening the relationship between departments. Moving into 2021, Cascade will track the amount of email referrals per district by rate schedule. This will be included in a quarterly report that has already

been developed for the ESR team that breaks down rebates paid per district. The quarterly rebate report is used as a tool for the ESRs while they're out in the field, reassuring customers rebates are frequently paid and available, right in their backyard.

Cascade's EE department recognizes the value in collaborating with the ESR team to help influence new customers to make wise decisions. As part of that collaboration EE develops tools for the ESR team to use while educating customers about energy efficiency. For instance, a handout was developed for the ESRs listing residential equipment incentives on one side and weatherization incentives on the other. The goal is to provide staff with an easily accessible and understandable document to leave with customers as a closing statement inviting customers to contact EE directly for follow up.