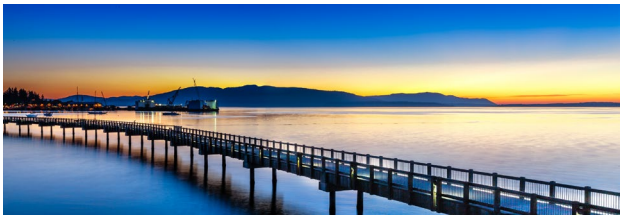
CASCADE NATURAL GAS DECOUPLING EVALUATION 2020 - 2022



H. Gil Peach - H. Gil Peach & Associates LLC
Mark Thompson - Forefront Economics Inc.

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Vision Statement

To be a world leader in developing truthful measurement and useful results; to support development of efficient, ethical, and effective practices, sustained economically; to advance human development. To improve the quality of life during the era of climate change.

Goals Statement

- To build inclusion, diversity, and social justice in support of all technical goals.
- Excellence in the integration of knowledge, method, and practice.
- Improvement and learning at all levels.
- Contextual awareness, sound measurement, analysis, and reporting.
- Anticipate and meet the needs of our clients.
- Awareness of human relevance and of the ethical core of research.
- To go further, to find better ways.

Mission Statement

With extensive experience in North America, we can provide the full range of evaluation, verification, policy, management, planning, regulatory and adaptation services – wherever and whenever there is a need.

Environmental Policy Statement

Collectively, we are at a Darwin moment. Either we move to a better model for production and income allocation; work intensely to mitigate climate change; anticipate and actualize inclusive climate adaptation - or we face being edited out of history.

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Table of Contents

B. List of Tables

C. Table of Figures

Introduction & Executive Summary

This evaluation of the Cascade Natural Gas Corporation (Cascade or CNGC) Decoupling Mechanisms is both a compliance evaluation and a policy evaluation of Cascade's decoupling as a specific rate reform (alternative form of rate making) within a specific window of time: 2020-2022. Compliance involves a check to ensure decoupling follows Commission orders and guidance. Policy evaluation assesses decoupling more generally as a rate reform.

In the ratemaking process, rates are typically set based on cost-of-service studies and other requirements. With rates as a given, utility revenue recovery is then dependent on sales. By contrast, in decoupling, a revenue target is set; then rates are adjusted within the decoupling mechanism to recover the revenue target. Both approaches, over time, should arrive at the same practical result. However, decoupling is designed to provide more stability in revenue recovery, by providing automatic adjustments between rate cases. Decoupling dissociates utility revenue and profit from sales of units of energy (Figure 1-2)[1]. Decoupling is designed to make utilities indifferent to annual sales volumes (Figure 1-1).[2]

> In public utility regulation, decoupling refers to the disassociation of a utility's profits from its sales of the energy commodity. Instead, a rate of return is aligned with meeting revenue targets, and rates are adjusted up or down to meet the target at the end of the adjustment period. - Wikipedia

Figure 1-2: Addressing Net Revenue Volatility.

> Decoupling is "…a way to make utilities indifferent to annual sales volumes by addressing the net revenue volatility associated with weather, changes in local economic conditions, and energy efficiency programs."[1]

Figure 1-1: Indifference to Sales Volumes.

Policy relevance for decoupling as a rate reform includes the designed effect on increasing revenue stability, examination of possible differences in effects on low-income customers (vs. other residential customers), possible effects on energy conservation

[1] Wikipedia: (https://en.wikipedia.org/wiki/Decoupling_(utility_regulation), accessed 12/25/2023.

[2] Migden-Ostrander, Janine & Richard Sedano, Nov. 7 2016, accessed 12/25/2023, Regulatory Assistance Project Knowledge Center, "Decoupling Design: Customizing Revenue Regulation to your State's Priorities," https://www.raponline.org/knowledge-center/decoupling-design-customizing-revenue-regulation-state-priorities/

programs, possible effects on utility organizational performance, and relation to climate change.[3]

Traditional and decoupled approaches to rates are contrasted in (Figure 1-3) and (Figure 1-4).[4] In traditional ratemaking the way to increase revenue is to increase sales of commodity energy units.

Traditional Ratemaking Equation

1 **Allowed Unit Price** = $\frac{\text{Allowed Revenue Requirement}}{\text{Expected Units of Consumption}}$

2 **Actual Revenue** = **Unit Price x Actual Units of Consumption**

Figure 1-3: Traditional Ratemaking.

Deferral decoupling works differently. Allowed revenue is first determined and projected using a model of expected sales. At the end of a year, the unit price for future units of energy consumption is then adjusted up or down, so there is no incentive to increase sales. Coupled with a process for setting conservation and low-income targets, the sales incentive is removed, and the utility can then be more oriented towards achieving conservation and low-income service targets. As decoupling is designed, the adjustments at the end of each balancing window are expected to be small.

[3] In principle, any policy/performance goal can be made part of the decoupling package if approved by the regulatory commission. Also, policy/performance goals are present in the regulatory environment through commission guidance and orders, and through state legislation.

[4] Equations from National Renewable Energy Laboratory: "Decoupling Policies, Options to Encourage Energy Efficiency Policies for Utilities, NREL/BR-6A2-46606, December 2009. (https://www.nrel.gov/docs/fy10osti/46606.pdf).

Ratemaking Equations with Deferral Decoupling

1 Allowed Revenue = Last Rate Case Revenue Requirement

2 Prior Period Over or Under Collection = Allowed Revenue – Actual Revenue

3 $$\text{Unit Price} = \frac{\text{(Allowed Revenue +/- Prior Period Over or Under Collection)}}{\text{Expected Units of Consumption}}$$

Figure 1-4: Decoupling Ratemaking.

Following this introduction, there are ten sections in the evaluation, beginning with a fidelity analysis (Section 1), and ending with the bibliography (Section 9) and Recommendations (Section 10).

Section 1, Fidelity Analysis, is focused on compliance. Did CNGC comply with the specifics of the decoupling order? The short answer is, "yes." The purpose of the Decoupling Mechanism is to decouple the Company's Commission-authorized revenues from sales, such that the portion of the Company's fixed costs planned for recovery through volumetric sales and not otherwise recovered from energy sales will be recovered through the mechanism. We traced the required inputs for the computations each year. We followed each computation for cumulative deferral and interest. We examined the operation of the Earnings Test each filing year (2021, 2022, 2023) and examined the operation of the Three Percent Test for each filing year.

Section 2 is concerned with billing impacts by rate schedule. Were there any differences in Decoupling tracker adjustments among the rate classes? This section traces the billing impacts of decoupling as implemented.

Section 3 reports on Low-Income weatherization.

Section 4 is focused on Residential Customers and Low-Income Customers (Billing impacts Analysis & Contrasts).

Section 5 reviews Conservation Programs. Were there any differences in conservation program savings, expenditures, and customers served between low-income customers and the rest of the residential class? How did spending develop for the commercial/industrial sector? This section also covers Conservation Program changes. Were any modifications made to the low-income conservation programs during the decoupling window examined, including any changes in funding levels and other changes to conservation measures and/or conservation programs? And it covers Conservation Program achievement.

Section 6 is an analysis of revenue effects. CNGC's decoupling mechanism has had a stabilizing effect on revenue, reducing variability. of margin revenue over the 2020-2022 period in all customer groups except interruptible customers. Interruptible customers had the least amount of margin revenue variability without decoupling and showed a slight increase with decoupling. Overall CNGC margin revenue variability has been reduced by nearly 50 percent from decoupling.

Section 7 is an analysis of possible adverse factors. We found no evidence of adverse impacts on customer service, price signals, or utility program operations as a result of the decoupling mechanisms. There is no indication of any decrease in service quality.

Section 8 is a discussion of decoupling from the perspective of climate change. We suggest changes in calculation of "normal weather," specifically to move away from the concept of "normal weather," in steps, and consideration of dropping the weather calculation from decoupling, since the weather calculation is not essential to the operation of decoupling. Given the bias associated with typical definitions of normal weather, Cascade should consider setting test year usage in a way that does not rely on biased estimates of normal weather. Examples include simple averages of usage over recent years and trend-based predictions of weather over the forecast period. Standard analysis supporting decoupling includes weather calculation, but this calculation is not essential.

Section 9 contains the Bibliography.

Section 10 provides a summary of Recommendations.

1. Fidelity Analysis

For the fidelity analysis, the evaluation objective is examination of the extent to which cumulative decoupling deferrals and resulting rate adjustments were calculated in accordance with the Commission order approving the decoupling mechanism. Specifically, the function of this section of the study is to trace the steps to ensure that the decoupling mechanism and the resulting rates have been calculated correctly.

A. Structure of Decoupling

The structure of Cascade Natural Gas Company's (Cascade's) Washington decoupling mechanism originated in Washington Utilities and Transportation Commission (WUTC or Commission) Order No. 4, Docket UG-152246, and the Joint Settlement Agreement (Figure 1-5).

Each year, Cascade files to true-up rates under each decoupled rate schedule. The decoupling mechanism operates on a cycle. Cascade implements deferrals through Rule 21. Rule 21, Decoupling Mechanism, provides the steps through which, each year, for decoupled rate schedules, Cascade defers the difference between billed revenue and authorized revenue for collection in the following year. Billed revenue and authorized revenue are developed for each decoupled rate schedule for each month. Deferred balances are recovered through the Schedule 594 adjustment rate. Order No. 4 also specifies two decoupling rate control tools: an annual (a) earnings test and (b) the decoupling rate adjustment cap (three percent cap).[5]

B. Schedule for Decoupling

Each April, the Commission Basis Report (CBR) for the previous year is developed. Decoupling rate adjustments are filed each September. Rate recovery through Schedule 594 is effective each November 1st, concurrently with the Purchased Gas Adjustment (PGA).[6] This schedule of activity, initially outlined in the Settlement Agreement (Figure 1-5) was initially authorized for five years. Subsequently, the Commission authorized continuation of decoupling, following the established schedule for each year. This evaluation covers the years 2020, 2021, and 2022.

[5] There are also additional requirements in the Order.
[6] Setting the effective date for Schedule 594 the same as for the Purchased Gas Adjustment (PGA) is designed to provide one rate change to the customer, instead of two.

The deferred monthly balances under the decoupling mechanism for September 1, 2016, through December 31, 2016, will be subject to the Commission Basis Report ("CBR") filed April 30, 2017, for the 2016 fiscal year. This amount will be amortized in a filing effective November 1, 2017, that will be submitted concurrently with the 2017 PGA and gas cost deferral amortization filings.

The subsequent decoupling deferral period, January 1, 2017, through December 31, 2017, will be amortized for rebate or surcharge in a filing effective November 1, 2018, and will be subject to the CBR filed April 30, 2018, for the 2017 fiscal year. The 12-month cycle of deferring then collecting after 10 months will continue for the duration of the mechanism.

Source: Docket UG-152286 Joint Settlement Agreement, May 13, 2016, P. 5.

Figure 1-5: Setting the Schedule for Decoupling (Settlement Agreement).

Table 1-1: Decoupling Timetable.

Decoupling Begins September 1, 2016					
Col. 1	**Col. 2**	**Col. 3**	**Col.4**	**Col. 5**	**Col. 6**
Develop Commission Basis Report (CBR) & Deferral				**File & Apply Rates**	
Year	**Span**	**Deferral Months Included**	**File CBR with WUTC**	**File Rate Adjustment (Schedule 594) with WUTC**	**Rate Adjustment (Schedule 594) Effective**
2016	Start-Up	Sep - Dec 2016	April 30, 2017	September 2017	November 1, 2017
2017	1	Jan – Dec 2017	April 30, 2018	September 2018	November 1, 2018
2018	2	Jan - Dec 2018	April 30, 2019	September 2019	November 1, 2019
2019	3	Jan - Dec 2019	April 30, 2020	September 2020	November 1, 2020
2020	4	Jan - Dec 2020	April 30, 2021	September 2021	November 1, 2021
2021	5	Jan - Dec 2021	April 30, 2022	September 2022	November 1, 2022
2022	6	Jan - Dec 2022	April 30, 2023	September 2023	November 1, 2023

Following the schedule, Cascade's decoupling mechanism rate adjustments have been filed annually.

Table 1-2: Decoupling Rate Adjustment Filings.

Decoupling Mechanism Rate Adjustment Filings				
Year	**Span**	**Rate Adjustment Effective Date**	**Advice Date**	**Docket Number**
2016	Start-Up	Nov. 1, 2017	W16-08-01	UG-152286
2017	1	Nov. 1, 2018	W17-09-03	UG-171014
2018	2	Nov. 1, 2019	W18-09-03	UG-180790
2019	3	Nov. 1, 2020	W19-09-03	UG-190767
2020	4	Nov. 1, 2021	W20-09-03	UG-200802
2021	5	Nov. 1, 2022	W21-09-03	UG-210708
2022	6	Nov. 1, 2023	W22-09-03	UG-220700

C. Deferral Year 2020, November 2021 Rate Adjustment

In this subsection, we first identify the variables used in computation of cumulative total deferral amounts. Second, we follow the calculation of cumulative total deferral amounts. Third, we examine how the cumulative total deferral amounts are developed into per therm Posted Rate Schedule 594 Tariff Rates. Fourth, we show how the per therm rates are translated into Percent Change in a typical monthly bill format. Fifth, we examine the implementation of two rate control tools, the Earnings Test, and the Three Percent Cap.

Variables

For each schedule and for each month included in a deferral Span, there are six data inputs to the computation of cumulative deferral: Number of Customers in Class, Actual Margin Revenue, Authorized Revenue, Interest Rate, Number of Days in Month, and Cumulative Deferral in the Prior Month (Table 1-3). These inputs were provided in response to Data Request DR-1. The interest rate applied (each month) is developed by the Federal Energy Regulatory Agency (FERC). Calendar Days are simply the number of days in each calendar month. In calculating the cumulative deferral amount for each month, the cumulative deferral amount from the prior month is added to the total deferral amount.

Table 1-3: Variables used in Calculation.

Variables used in Computation of Cumulative Deferral Amounts	
Variable	**Source**
Number of Customers in Class	CA1499
Actual Margin Revenue	CC&B report: CA1501 Revenue by District
Authorized Revenue	Sequence of CNGC Rule 21 Decoupling Mechanism Rate Sheets, Tables 1 & 2
Interest Rate	Any deferral balance, either in the surcharge or rebate direction, will accrue interest at the FERC interest rate consistent with gas cost deferred balances. [Joint Settlement Agreement, P. 5, §15.]
Number of Days in the Month	Calendar Days
Cumulative Deferral in the Prior Month	Prior Month Cumulative Deferral Value
Note: Provided in response to DR-1. Set of Excel spreadsheets for Rule 21 Decoupling Mechanism.	

Steps in Calculation

The computation of Cumulative Deferral Amounts is specified in five steps. The decoupling mechanism development of deferrals is specified in the Rule 21 Decoupling Mechanism Rate Sheets. These Rule 21 Rate Sheets state that "[on a monthly basis the Company will perform the following steps separately for each customer class that is applicable to the rate adjustment in this Rule:

1) Record Number of Customers per Customer Class

2) Determine Actual Margin Revenues

3) Determine Authorized Revenue by multiplying the number of Customers per Customer class (No. 1 above) times the Authorized Revenue for the corresponding month per Customer class as established in Tables l & 2 [of the appropriate Rule 21 Decoupling Mechanism Rate Sheet].

4) Determine then record the Deferral Amount by subtracting the Authorized Margin Revenue (No. 3 above) from Actual Margin Revenue (No. 2 above).

5) Annually determine the new rate to be applied in Schedule 594 by taking the annual sum of monthly Deferral Amounts and dividing the total by forecasted volumes per Customer class.]"[7]

[7] There are additional sub-steps.

Table 1-4: Application of Calculation Method (Example).

DEFERRED ACCOUNTING DETAILS - TWELVE MONTHS ENDED NOVEMBER 30, 2020 (Example Table)		
Line No.	**Rate Schedule & Description**	**Jan-20**
	Interest Rate	4.96%
	Days	31
	4800 Residential - 503	
1	Customer Count by Rate Class	**194,266**
	CA1501 Revenue by District	**5,833,737.54**
	Unbilled Therms & Revenue - Current Month	**3,137,612.23**
	Unbilled Therms & Revenue - Prior Month	-3,180,351.56
2	Total Actual Margin Revenues	5,790,998.21
3	Authorized Revenue	-5,895,973.10
4	Deferral Amount	-104,974.89
	Interest	5,415.02
	Monthly Deferral Total	-99,559.87
	Cumulative Deferral Total	1,185,873.33

The first four steps in calculation are shown in Table 1-4, which is an example to serve as a key to the format of Table 1-5, and its continuation in Table 1-6 and Table 1-7. Table 1-4 shows one month of data for the Residential class.

Step 5 is to sum across all twelve months for 2020, taking the annual sum of monthly Deferral Amounts and dividing by forecasted volumes per consolidated customer class. Only part of Step 5, computing the total per rate schedule (Cumulative Deferral Total), is shown in Table 1-5 through Table 1-7.[8] The other part of Step 5 is to consolidate individual rate schedules Deferred Amount totals into the set of five consolidated rate schedules. Step 5 results are shown in Column 2 of 9.

[8] Note: These three tables say "…Ended November 30, 2020" but data actually runs through December 31, 2020.

Table 1-5: Twelve Months Ended December 2020 – Part 1.

RULE 21 DECOUPLING MECHANISM

DEFERRED ACCOUNTING DETAILS - TWELVE MONTHS ENDED NOVEMBER 30, 2020

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Ammortize JE	Nov-20	Dec-20	YTD
Interest Rate	4.96%	4.96%	4.96%	4.75%	4.75%	4.75%	3.43%	3.43%	3.43%	3.25%		3.25%	3.25%	
Days	31	29	31	30	31	30	31	31	30	31		30	31	
4800 Residential - 503														
Customer Count by Rate Class	**194,266**	**194,516**	**194,699**	**194,429**	**194,478**	**194,593**	**194,759**	**194,934**	**195,321**	**196,389**		**196,954**	**197,405**	
CA1501 Revenue by District	**5,833,737.54**	**4,762,707.60**	**5,029,134.43**	**4,322,226.46**	**2,116,022.56**	**1,555,485.45**	**1,250,731.19**	**849,117.64**	**916,236.85**	**1,315,220.16**		**3,247,769.27**	**5,740,869.00**	
Unbilled Therms & Revenue - Current Month	**3,137,612.23**	**2,956,035.45**	**2,714,549.71**	**1,126,196.45**	**694,630.08**	**372,775.63**	**244,284.74**	**401,175.11**	**575,406.09**	**1,822,890.71**		**3,839,973.37**	**4,103,145.22**	
Unbilled Therms & Revenue - Prior Month	(3,180,351.56)	(3,137,612.23)	(2,956,035.45)	(2,714,549.71)	(1,126,196.45)	(694,630.08)	(372,775.63)	(244,284.74)	(401,175.11)	(575,406.09)		(1,822,890.71)	(3,839,973.37)	
Total Actual Margin Revenues	5,790,998.21	4,581,130.82	4,787,648.69	2,733,873.20	1,684,456.19	1,233,631.00	1,122,240.30	1,006,008.01	1,090,467.83	2,562,704.78		5,264,851.93	6,004,040.85	
Authorized Revenue	(5,895,973.10)	(4,337,706.80)	(4,540,380.68)	(3,116,696.87)	(1,866,988.80)	(1,190,909.16)	(917,314.89)	(450,297.54)	(1,298,884.65)	(2,798,543.25)		(5,607,280.38)	(7,189,490.10)	
Deferral Amount	(104,974.89)	243,424.02	247,268.01	(420,323.67)	**(182,532.61)**	**42,721.84**	**204,925.41**	**555,710.47**	**(245,916.82)**	**(235,838.47)**	(1,285,433.20)	**(342,428.45)**	**(1,185,449.25)**	(1,423,414.41)
Interest	5,415.02	4,673.32	6,040.75	6,587.32	5,137.79	4,279.48	3,330.17	3,936.85	5,387.60	4,611.10	(46,518.05)	286.74	(648.10)	2,519.99
Monthly Deferral Total	(99,559.87)	248,097.34	253,308.76	(413,736.35)	(177,394.82)	47,001.32	208,255.58	559,647.32	(240,529.22)	(231,227.37)	(1,331,951.25)	(342,141.71)	(1,186,097.35)	(1,420,894.42)
Cumulative Deferral Total	1,185,873.33	1,433,970.67	1,687,279.43	1,273,543.08	1,096,148.26	1,143,149.58	1,351,405.16	1,911,052.48	1,670,523.26	1,439,295.89	107,344.64	(234,797.07)	(1,420,894.42)	
4809 Industrial - 505														
Customer Count by Rate Class	**479**	**479**	**475**	**478**	**478**	**478**	**478**	**481**	**481**	**485**		**486**	**488**	
CA1501 Revenue by District - First 500	**34,994.14**	**34,222.34**	**34,696.64**	**34,970.40**	**26,947.21**	**21,284.09**	**19,269.67**	**16,986.58**	**17,895.93**	**20,968.09**		**31,738.90**	**37,438.20**	
CA1501 Revenue by District - Next 3,500	**103,947.75**	**94,155.63**	**98,050.40**	**89,289.61**	**57,560.25**	**48,916.62**	**44,595.66**	**40,134.03**	**46,193.33**	**53,973.08**		**71,888.11**	**106,893.55**	
CA1501 Revenue by District - Over 4,000	**84,740.85**	**66,863.65**	**75,927.74**	**65,312.71**	**36,686.10**	**37,408.24**	**31,267.85**	**27,010.82**	**40,096.81**	**90,654.12**		**44,073.47**	**83,147.19**	
Total Actual Margin Revenues	223,682.74	195,241.62	208,674.78	189,572.72	121,193.56	107,608.95	95,133.18	84,131.43	104,186.07	165,595.29		147,700.48	227,478.94	
Authorized Revenue	(238,652.17)	(202,674.48)	(237,633.00)	(187,782.30)	(136,282.58)	(101,235.62)	(89,572.42)	(95,613.18)	(109,547.75)	(176,869.80)		(168,885.00)	(251,822.64)	
Deferral Amount	(14,969.43)	(7,432.86)	(28,958.22)	1,790.42	(15,089.02)	6,373.33	5,560.76	(11,481.75)	(5,361.68)	(11,274.51)	(204,177.64)	(21,184.52)	(24,343.70)	(126,371.18)
Interest	860.12	749.03	772.53	605.91	635.78	558.84	437.19	454.66	408.91	386.69	(7,388.93)	(220.01)	(286.42)	(2,025.70)
Monthly Deferral Total	(14,109.31)	(6,683.83)	(28,185.69)	2,396.33	(14,453.24)	6,932.17	5,997.95	(11,027.09)	(4,952.77)	(10,887.82)	(211,566.57)	(21,404.53)	(24,630.12)	(128,396.88)
Cumulative Deferral Total	190,068.33	183,384.50	155,198.81	157,595.14	143,141.90	150,074.07	156,072.02	145,044.93	140,092.16	129,204.34	(82,362.23)	(103,766.76)	(128,396.88)	
4809 Industrial - 511														
Customer Count by Rate Class	**16**	**16**	**17**	**17**	**17**	**17**	**17**	**17**	**18**	**18**		**18**	**18**	
CA1501 Revenue by District - First 20,000	**31,459.36**	**28,234.52**	**27,061.43**	**32,461.70**	**22,456.53**	**22,642.96**	**24,791.93**	**22,867.41**	**23,044.32**	**26,547.29**		**26,778.21**	**34,184.86**	
CA1501 Revenue by District - Next 80,000	**19,901.91**	**18,053.30**	**14,085.93**	**28,906.79**	**10,473.64**	**32,313.98**	**22,118.69**	**22,093.12**	**22,931.17**	**25,211.63**		**18,386.87**	**23,202.53**	
CA1501 Revenue by District - Over 100,000	**848.84**	**866.37**	**471.69**	**3,844.51**		**1,177.55**	**140.43**	**43.44**	**515.23**	**309.16**		**877.19**	**1,028.32**	
Total Actual Margin Revenues	52,210.11	47,154.19	41,619.05	65,213.00	32,930.17	56,134.49	47,051.05	45,003.97	46,490.72	52,068.08		46,042.27	58,415.71	
Authorized Revenue	(33,802.56)	(27,249.60)	(46,727.73)	(39,337.66)	(30,023.70)	(21,423.74)	(18,561.45)	(18,755.93)	(18,718.20)	(31,610.16)		(29,124.90)	(32,359.86)	
Deferral Amount	18,407.55	19,904.59	(5,108.68)	25,875.34	2,906.47	34,710.75	28,489.60	26,248.04	27,772.52	20,457.92	(297,923.25)	16,917.37	26,055.85	242,637.32
Interest	1,255.03	1,251.55	1,426.99	1,308.11	1,461.38	1,431.29	1,173.28	1,259.69	1,296.61	1,349.76	(10,781.45)	539.85	606.03	3,578.12
Monthly Deferral Total	19,662.58	21,156.14	(3,681.69)	27,183.45	4,367.85	36,142.04	29,662.88	27,507.73	29,069.13	21,807.68	(308,704.70)	17,457.22	26,661.88	246,215.44
Cumulative Deferral Total	317,585.83	338,741.97	335,060.28	362,243.73	366,611.58	402,753.62	432,416.50	459,924.23	488,993.36	510,801.04	202,096.34	219,553.56	246,215.44	
4810 Commercial - 04LV														
Customer Count by Rate Class	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		**1**	**1**	
CA1501 - Revenue by District	**1,053.42**	**1,130.95**	**1,076.10**	**1,283.61**	**1,018.14**	**580.93**	**549.52**	**246.88**	**213.63**	**168.34**		**861.32**	**1,481.26**	
CA1501A - Current Month Revenue by District	**1,130.95**	**1,076.10**	**1,283.61**	**1,018.14**	**580.93**	**549.52**	**246.88**	**213.63**	**168.34**	**861.32**		**1,481.26**	**1,972.66**	
Prior Month CA1501A Revenue by District	1,053.42	(1,130.95)	(1,076.10)	(1,283.61)	(1,018.14)	(580.93)	(549.52)	(246.88)	(213.63)	(168.34)		(861.32)	(1,481.26)	
Total Actual Margin Revenues	3,237.79	1,076.10	1,283.61	1,018.14	580.93	549.52	246.88	213.63	168.34	861.32		1,481.26	1,972.66	
Authorized Revenue	(127.65)	(93.93)	(89.98)	(67.79)	(38.59)	(34.00)	(28.24)	(15.79)	(38.63)	(67.99)		(111.08)	(147.59)	
Deferral Amount	3,110.14	982.17	1,193.63	950.35	542.34	515.52	218.64	197.84	129.71	793.33	(6,187.70)	1,370.18	1,825.07	11,828.92
Interest	26.07	36.74	43.57	45.21	50.73	51.41	40.01	40.77	40.13	39.76	(223.94)	23.57	28.20	242.23
Monthly Deferral Total	3,136.21	1,018.91	1,237.20	995.56	593.07	566.93	258.65	238.61	169.84	833.09	(6,411.64)	1,393.75	1,853.27	12,071.15
Cumulative Deferral Total	9,323.91	10,342.82	11,580.02	12,575.58	13,168.65	13,735.58	13,994.23	14,232.84	14,402.68	15,235.77	8,824.13	10,217.88	12,071.15	

Table 1-6: Twelve Months Ended December 2020 - Part 2.

RULE 21 DECOUPLING MECHANISM

DEFERRED ACCOUNTING DETAILS - TWELVE MONTHS ENDED NOVEMBER 30, 2020

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Ammortize JE	Nov-20	Dec-20	YTD
Interest Rate	4.96%	4.96%	4.96%	4.75%	4.75%	4.75%	3.43%	3.43%	3.43%	3.25%		3.25%	3.25%	
Days	31	29	31	30	31	30	31	31	30	31		30	31	
4810 Commercial - 04LV														
Customer Count by Rate Class	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		**1**	**1**	
CA1501 - Revenue by District	**1,053.42**	**1,130.95**	**1,076.10**	**1,283.61**	**1,018.14**	**580.93**	**549.52**	**246.88**	**213.63**	**168.34**		**861.32**	**1,481.26**	
CA1501A - Current Month Revenue by District	**1,130.95**	**1,076.10**	**1,283.61**	**1,018.14**	**580.93**	**549.52**	**246.88**	**213.63**	**168.34**	**861.32**		**1,481.26**	**1,972.66**	
Prior Month CA1501A Revenue by District	1,053.42	(1,130.95)	(1,076.10)	(1,283.61)	(1,018.14)	(580.93)	(549.52)	(246.88)	(213.63)	(168.34)		(861.32)	(1,481.26)	
Total Actual Margin Revenues	3,237.79	1,076.10	1,283.61	1,018.14	580.93	549.52	246.88	213.63	168.34	861.32		1,481.26	1,972.66	
Authorized Revenue	(127.65)	(93.93)	(89.98)	(67.79)	(38.59)	(34.00)	(28.24)	(15.79)	(38.63)	(67.99)		(111.08)	(147.59)	
Deferral Amount	3,110.14	982.17	1,193.63	950.35	542.34	515.52	218.64	197.84	129.71	793.33	(6,187.70)	1,370.18	1,825.07	11,828.92
Interest	26.07	36.74	43.57	45.21	50.73	51.41	40.01	40.77	40.13	39.76	(223.94)	23.57	28.20	242.23
Monthly Deferral Total	3,136.21	1,018.91	1,237.20	995.56	593.07	566.93	258.65	238.61	169.84	833.09	(6,411.64)	1,393.75	1,853.27	12,071.15
Cumulative Deferral Total	9,323.91	10,342.82	11,580.02	12,575.58	13,168.65	13,735.58	13,994.23	14,232.84	14,402.68	15,235.77	8,824.13	10,217.88	12,071.15	
4810 Commercial - 504														
Customer Count by Rate Class	**26,861**	**26,878**	**26,875**	**26,754**	**26,697**	**26,643**	**26,617**	**26,605**	**26,609**	**26,785**		**26,882**	**26,978**	
CA1501 Revenue by District	**3,359,717.02**	**2,777,567.54**	**2,854,848.28**	**2,242,040.88**	**1,085,875.76**	**832,124.22**	**746,159.64**	**570,297.25**	**645,275.03**	**837,256.83**		**1,703,921.93**	**3,151,444.12**	
Unbilled Therms & Revenue - Current Month	**1,993,534.03**	**1,957,205.49**	**1,733,575.46**	**689,271.49**	**459,374.96**	**249,107.94**	**175,775.40**	**340,469.59**	**493,236.44**	**1,358,997.52**		**1,997,335.03**	**2,257,289.61**	
Unbilled Therms & Revenue - Prior Month	(2,407,512.25)	(1,993,534.03)	(1,957,205.49)	(1,733,575.46)	(689,271.49)	(459,374.96)	(249,107.94)	(175,775.40)	(340,469.59)	(493,236.44)		(1,358,997.52)	(1,997,335.03)	
Total Actual Margin Revenues	2,945,738.80	2,741,239.00	2,631,218.25	1,197,736.91	855,979.23	621,857.20	672,827.10	734,991.44	798,041.88	1,703,017.91		2,342,259.44	3,411,398.70	
Authorized Revenue	(3,428,806.65)	(2,524,650.54)	(2,418,212.50)	(1,813,653.66)	(1,030,237.23)	(905,862.00)	(751,664.08)	(420,092.95)	(1,027,905.67)	(1,821,112.15)		(2,986,052.56)	(3,981,683.02)	
Deferral Amount	(483,067.85)	216,588.46	213,005.75	(615,916.75)	(174,258.00)	(284,004.80)	(78,836.98)	314,898.49	(229,863.79)	(118,094.24)	(2,124,434.71)	(643,793.12)	(570,284.32)	(2,453,627.15)
Interest	8,949.40	6,503.60	7,891.92	8,176.40	5,997.17	5,146.81	3,028.07	2,807.22	3,612.34	2,912.34	(76,880.49)	(3,369.51)	(5,268.17)	(30,492.90)
Monthly Deferral Total	(474,118.45)	223,092.06	220,897.67	(607,740.35)	(168,260.83)	(278,857.99)	(75,808.91)	317,705.71	(226,251.45)	(115,181.90)	(2,201,315.20)	(647,162.63)	(575,552.49)	(2,484,120.05)
Cumulative Deferral Total	1,650,316.26	1,873,408.32	2,094,305.99	1,486,565.64	1,318,304.81	1,039,446.82	963,637.91	1,281,343.62	1,055,092.17	939,910.27	(1,261,404.93)	(1,908,567.56)	(2,484,120.05)	
4810 Commercial - 11LV														
Customer Count by Rate Class	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**2**		**2**	**2**	
CA1501 Revenue by District - First 20,000	**19,935.75**	**19,499.55**	**19,032.68**	**21,164.26**	**20,485.26**	**19,295.15**	**14,918.06**	**14,182.49**	**13,834.62**	**13,931.46**		**4,903.67**	**5,690.47**	
CA1501 Revenue by District - Next 80,000	**41,795.55**	**41,337.63**	**40,111.26**	**44,241.38**	**37,030.64**	**31,635.93**	**27,763.06**	**27,731.27**	**27,329.20**	**27,049.73**		**437.73**	**4,695.21**	
CA1501 Revenue by District - Over 100,000	**31,678.16**	**34,423.99**	**31,526.86**	**42,051.57**	**32,546.26**	**19,928.15**	**13,678.68**	**12,426.16**	**11,223.95**	**10,743.46**				
CA1501A Revenue by District - First 20,000	**19,499.55**	**19,032.68**	**21,164.26**	**20,485.26**	**19,295.15**	**14,918.06**	**14,182.49**	**13,834.62**	**13,931.46**	**4,903.67**		**5,690.47**	**6,270.70**	
CA1501A Revenue by District - Next 80,000	**41,337.63**	**40,111.26**	**44,241.38**	**37,030.64**	**31,635.93**	**27,763.06**	**27,731.27**	**27,329.20**	**27,049.73**	**437.73**		**4,695.21**	**7,164.96**	
CA1501A Revenue by District - Over 100,000	**34,423.99**	**31,526.86**	**42,051.57**	**32,546.26**	**19,928.15**	**13,678.68**	**12,426.16**	**11,223.95**	**10,743.46**					
Prior Month CA1501A Revenue by District	(93,409.46)	(95,261.17)	(90,670.80)	(107,457.21)	(90,062.16)	(70,859.23)	(56,359.80)	(54,339.92)	(52,387.77)	(51,724.65)		(5,341.40)	(10,385.68)	
Total Actual Margin Revenues	95,261.17	90,670.80	107,457.21	90,062.16	70,859.23	56,359.80	54,339.92	52,387.77	51,724.65	5,341.40		10,385.68	13,435.66	
Authorized Revenue	(14,788.62)	(11,921.70)	(19,240.83)	(16,197.86)	(12,362.70)	(8,821.54)	(7,642.95)	(7,723.03)	(7,279.30)	(3,512.24)		(3,236.10)	(3,595.54)	
Deferral Amount	**80,472.55**	78,749.10	88,216.38	**73,864.30**	**58,496.53**	**47,538.26**	**46,696.97**	**44,664.74**	**44,445.35**	1,829.16	(231,584.88)	7,149.58	9,840.12	581,963.04
Interest	975.58	1,233.61	1,655.62	1,885.25	2,253.68	2,418.16	1,949.90	2,091.62	2,155.96	2,239.54	(8,380.76)	1,537.16	1,612.38	13,627.70
Monthly Deferral Total	81,448.13	79,982.71	89,872.00	75,749.55	60,750.21	49,956.42	48,646.87	46,756.36	46,601.31	4,068.70	(239,965.64)	8,686.74	11,452.50	595,590.74
Cumulative Deferral Total	313,033.01	393,015.72	482,887.72	558,637.27	619,387.48	669,343.90	717,990.77	764,747.13	811,348.44	815,417.14	575,451.50	584,138.24	595,590.74	

Table 1-7: Twelve Months Ended December 2020 - Part 3.

RULE 21 DECOUPLING MECHANISM

DEFERRED ACCOUNTING DETAILS - TWELVE MONTHS ENDED NOVEMBER 30, 2020

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Ammortize JE	Nov-20	Dec-20	YTD
Interest Rate	4.96%	4.96%	4.96%	4.75%	4.75%	4.75%	3.43%	3.43%	3.43%	3.25%		3.25%	3.25%	
Days	31	29	31	30	31	30	31	31	30	31		30	31	
4810 Commercial - 511														
Customer Count by Rate Class	**76**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**73**		**73**	**73**	
CA1501 Revenue by District - First 20,000	**141,553.95**	**124,528.55**	**133,603.89**	**115,184.13**	**63,743.48**	**54,814.76**	**59,524.27**	**37,275.69**	**38,459.16**	**52,723.80**		**90,356.07**	**140,418.32**	
CA1501 Revenue by District - Next 80,000	**44,374.91**	**31,429.95**	**39,312.01**	**26,958.38**	**15,120.59**	**18,254.55**	**21,851.68**	**12,044.62**	**10,147.27**	**18,119.86**		**28,883.70**	**42,209.48**	
CA1501 Revenue by District - Over 100,000	**3,645.15**	**1,965.27**	**2,992.40**	**2,839.34**	**835.10**	**678.42**						**1,616.72**	**6,787.44**	
Unbilled Therms & Revenue - Current Month	**99,787.22**	**95,251.49**	**93,184.93**	**38,930.60**	**28,686.79**	**19,013.29**	**16,186.86**	**24,556.40**	**30,681.15**	**96,049.40**		**123,026.79**	**125,192.50**	
Unbilled Therms & Revenue - Prior Month	(121,207.67)	(99,787.22)	(95,251.49)	(93,184.93)	(38,930.60)	(28,686.79)	(19,013.29)	(16,186.86)	(24,556.40)	(30,681.15)		(96,049.40)	(123,026.79)	
Total Actual Margin Revenues	168,153.56	153,388.04	173,841.74	90,727.52	69,455.36	64,074.23	78,549.52	57,689.85	54,731.18	136,211.91		147,833.88	191,580.95	
Authorized Revenue	(160,562.16)	(127,732.50)	(206,151.75)	(173,548.50)	(132,457.50)	(94,516.50)	(81,888.75)	(82,746.75)	(77,992.50)	(128,196.76)		(118,117.65)	(131,237.21)	
Deferral Amount	7,591.40	25,655.54	(32,310.01)	(82,820.98)	(63,002.14)	(30,442.27)	(3,339.23)	(25,056.90)	(23,261.32)	8,015.15	(284,826.75)	29,716.23	60,343.74	(128,910.79)
Interest	1,199.86	1,157.10	1,349.85	1,130.12	838.23	568.50	337.17	328.43	248.12	179.41	(10,307.50)	(592.86)	(532.23)	(4,095.80)
Monthly Deferral Total	8,791.26	26,812.64	(30,960.16)	(81,690.86)	(62,163.91)	(29,873.77)	(3,002.06)	(24,728.47)	(23,013.20)	8,194.56	(295,134.25)	29,123.37	59,811.51	(133,006.59)
Cumulative Deferral Total	293,618.01	320,430.65	289,470.49	207,779.63	145,615.72	115,741.95	112,739.89	88,011.42	64,998.22	73,192.78	(221,941.47)	(192,818.10)	(133,006.59)	
4811 Commercial - 05LV														
Customer Count by Rate Class	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		**1**	**1**	
CA1501 Revenue by District - First 500	**46.59**	**15.17**	**60.87**	**36.72**	**38.94**									
CA1501 Revenue by District - Next 3,500		-	-											
CA1501A Revenue by District - First 500 - Current Month	**15.17**	**60.87**	**36.72**	**38.94**	-									
CA1501A Revenue by District - Next 3,500 - Current Month		-												
Prior Month CA1501A Revenue by District - First 500	(46.59)	(15.17)	(60.87)	(36.72)	(38.94)	-	-	-	-	-		-	-	
Prior Month CA1501A Revenue by District - Next 3,500	-	-	-	-	-	-	-	-	-	-		-	-	
Total Actual Margin Revenues	15.17	60.87	36.72	38.94	-	-	-	-	-	-		-	-	
Authorized Revenue	(498.23)	(423.12)	(500.28)	(392.85)	(285.11)	(211.79)	(187.39)	(198.78)	(227.75)	(364.68)		(347.50)	(516.03)	
Deferral Amount	(483.06)	(362.25)	(463.56)	(353.91)	(285.11)	(211.79)	(187.39)	(198.78)	(227.75)	(364.68)	3,451.18	(347.50)	(516.03)	(4,001.81)
Interest	(14.54)	(15.56)	(18.23)	(18.77)	(20.90)	(21.42)	(16.66)	(17.26)	(17.31)	(17.63)	124.90	(8.53)	(9.79)	(71.70)
Monthly Deferral Total	(497.60)	(377.81)	(481.79)	(372.68)	(306.01)	(233.21)	(204.05)	(216.04)	(245.06)	(382.31)	3,576.08	(356.03)	(525.82)	**(4,073.51)**
Cumulative Deferral Total	(3,948.78)	(4,326.59)	(4,808.38)	(5,181.06)	(5,487.07)	(5,720.28)	(5,924.33)	(6,140.37)	(6,385.43)	(6,767.74)	(3,191.66)	(3,547.69)	(4,073.51)	
4813 Industrial - 570														
Customer Count by Rate Class	**8**	**8**	**8**	**8**	**8**	**7**	**7**	**7**	**7**	**7**		**7**	**7**	
CA1501 Revenue by District - First 30,000	**9,570.31**	**9,150.39**	**8,394.20**	**9,583.86**	**8,673.03**	**7,743.01**	**6,903.17**	**7,448.82**	**7,314.08**	**6,614.88**		**10,139.36**	**9,092.36**	
CA1501 Revenue by District - Over 30,000	**2,985.23**	**3,153.98**	**2,757.58**	**3,446.60**	**2,613.25**	**1,498.92**	**912.14**	**655.97**	**532.58**	**584.95**		**1,851.56**	**3,349.01**	
CA1501A Curr Month Revenue by District - First 30,000	**9,150.39**	**8,394.20**	**9,583.86**	**8,673.03**	**7,732.70**	**6,903.17**	**7,448.82**	**7,314.08**	**6,614.88**	**10,139.36**		**9,092.36**	**9,501.48**	
CA1501A Curr Month Revenue by District - Over 30,000	**3,153.98**	**2,757.58**	**3,446.60**	**2,613.25**	**1,498.92**	**912.14**	**655.97**	**532.58**	**584.95**	**1,851.56**		**3,349.01**	**3,900.78**	
Prior Month CA1501A Revenue by District - First 30,000	(9,570.31)	(9,150.39)	(8,394.20)	(9,583.86)	(8,673.03)	(7,732.70)	(6,903.17)	(7,448.82)	(7,314.08)	(6,614.88)		(10,139.36)	(9,092.36)	
Prior Month CA1501A Revenue by District - Over 30,000	(2,985.23)	(3,153.98)	(2,757.58)	(3,446.60)	(2,613.25)	(1,498.92)	(912.14)	(655.97)	(532.58)	(584.95)		(1,851.56)	(3,349.01)	
Total Actual Margin Revenues	12,304.37	11,151.78	13,030.46	11,286.28	9,231.62	7,825.62	8,104.79	7,846.66	7,199.83	11,990.92		12,441.37	13,402.26	
Authorized Revenue	(18,824.16)	(18,920.32)	(13,637.12)	(13,531.36)	(11,273.36)	(7,121.59)	(5,711.86)	(6,110.58)	(5,177.13)	(6,577.06)		(10,961.79)	(12,067.51)	
DEFERRAL AMOUNT	(6,519.79)	(7,768.54)	(606.66)	(2,245.08)	(2,041.74)	704.03	2,392.93	1,736.08	2,022.70	5,413.86	20,894.48	1,479.58	1,334.75	(4,097.88)
Interest	(88.02)	(108.38)	(149.04)	(141.07)	(155.40)	(158.97)	(117.03)	(110.40)	(102.26)	(94.82)	756.15	(19.72)	(16.35)	(505.31)
Monthly Deferral Total	(6,607.81)	(7,876.92)	(755.70)	(2,386.15)	(2,197.14)	545.06	2,275.90	1,625.68	1,920.44	5,319.04	21,650.63	1,459.86	1,318.40	(4,603.19)
Cumulative Deferral Total	(27,502.29)	(35,379.21)	(36,134.91)	(38,521.06)	(40,718.20)	(40,173.14)	(37,897.24)	(36,271.56)	(34,351.12)	(29,032.08)	(7,381.45)	(5,921.59)	(4,603.19)	
TOTAL DEFERRAL AMOUNT	(500,433.38)	569,740.23	482,236.64	(1,019,179.98)	(375,263.28)	(182,095.13)	205,920.71	906,718.23	(430,261.08)	(329,062.48)	(4,410,222.47)	(951,120.65)	(1,681,193.77)	(3,303,993.94)
Interest (rounding)	18,578.52	15,481.00	19,013.96	19,578.48	16,198.46	14,274.10	10,162.10	10,791.58	13,030.09	11,606.16	(159,600.07)	(1,823.29)	(4,514.45)	(17,223.37)
Cumulative Deferral Total	3,928,367.56	4,513,588.79	5,014,839.39	4,015,237.89	3,656,173.07	3,488,352.04	3,704,434.85	4,621,944.66	4,204,713.67	3,887,257.35	(682,565.19)	(1,635,509.13)	(3,321,217.35)	(3,321,217.31)

Column 2 of Table 1-8 provides a summary of the final (12/31/2020) year-end Cumulative Deferral Totals for each consolidated schedule (from Table 1-5 through Table 1-7).

Table 1-8: End-of-Year Consolidated Deferrals (2020), Interest, and Rate per Therm.

Line	Consolidated Rate Schedule	Account Balance 12/31/2020 (Cumulative Deferral Totals)	Interest Assignments & Amortization through 10/31/2021	Interest Accruals Through Amortization	Amount	Forecasted Therms	Rate per Therm
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
1	503	456,198	930,387	17,671.34	1,404,256	130,679,417	0.01075
2	504	702,020	1,713,078	32,208.81	2,447,307	89,120,218	0.02746
3	505	(60)	145,076	1,382.02	146,398	11,950,578	0.00727
4	511	(1,159,684)	236,203	(14,886.90)	(938,368)	17,432,493	(0.05383)
5	570	26,577	(20,297)	97.66	6,378	2,264,179	0.00282

From Cumulative Total Deferral Amounts to Rate Schedule 594 Tariffs

In Table 1-8, for each Consolidated Rate Schedule, interest assignments (Column 3) and interest accruals (Column 4) are added to the balances as of 12/31/2020 (Column 2) to yield the dollar amounts (Column 5) for calculation of a rate per therm. For each schedule, Forecasted Therms (Column 6) are used to derive the rate per therm (Column 7) by dividing the dollar amount in each line for Column 5 by the number of Forecasted Therms in Column 6. This feeds the posted 594 Tariff Rate for each schedule (Table 1-9, Column 6), with adjustment for Commercial (RS 504).

Table 1-9: Schedule 594 Rate Tariff Posted November 1, 2021.

Line	Description	Rate Schedule	Reverse Prior Decoupling Rate Adjustment	Decoupling Related Temporary Rate Adjustment	Incremental R/S 594 Rate Change	Posted R/S 594 Tariff Rate
	Col. 1	Col. 2	Col. 3	Col.4	Col. 5	Col. 6
1	Residential	503	$ 0.00910	$ 0.01075	$ 0.01985	$ 0.01075
2	Commercial	504	$ 0.02414	$ 0.00319	$ 0.02733	$ 0.00319
3	Com-Ind Dual Service	511	$ 0.01908	$ (0.05383)	$ (0.03475)	$ (0.05383)
4	Industrial Firm	505	$ 0.01417	$ 0.00727	$ 0.02144	$ 0.00727
5	Industrial Interr.	570	$ (0.01199)	$ 0.00282	$ (0.00917)	$ 0.00282

From Rate Schedule 594 Tariffs to Percent Change in Typical Monthly Bill

In Table 1-10, Therm Sales (Column 3) are actual calendar year 2020 therms. Revenue (Column 4) is what yearly revenue would have been at the new rate placed into effect on

November 1, 2020. This amount is the total revenue, not the adjusted amount. Per Therm Rate Change (Column 5) is the rate adjustment. The Amount of Change (Column 6) is the change in revenue (plus or minus) due to the Rate Schedule 594 adjustment. Percent Change, shown in Column 7, is the Amount of Change (Column 6) divided by the Amount of Revenue (Column 4).

Table 1-10: DMA Typical Monthly Therm Usage and Cost by Class.

Line	Description	Rate Schedule	Average Number of Bills	Forecasted Therms Sold	Actual Revenue	Per Therm Decoupling Charge	Amount of Change	Percentage Change
	Col. 1	Col. 2	Col. 3	Col. 3	Col. 4	Col 5	Col. 6	Col. 7
	CORE MARKET RATE SCHEDULES							
1	Residential	503	197,371	130,679,417	132,980,825	$ 0.01985	$ 2,593,464	1.95%
2	Commercial	504	26,933	89,120,218	81,203,573	$ 0.02733	$ 2,435,834	3.00%
3	Industrial Firm	505	484	11,930,578	8,959,376	$ 0.02144	$ 255,792	2.86%
4	Large Volume	511	95	17,432,493	12,092,638	$ (0.03475)	$ (605,762)	-5.01%
5	Industrial Interruptible	570	7	2,264,179	1,392,481	$ (0.00917)	$ (20,769)	-1.49%
6			224,890	251,426,886	236,628,892		$ 4,658,558	1.97%

Control Tools: The Earnings Test and the Three Percent Cap

The Earnings Test and the Three Percent Cap are examined in this subsection of the study.

Earnings Test - 2021

The earnings test is based on Cascade's year-end Commission Basis Report (CBR) stated on an average of monthly averages (AMA) basis and prepared according to WAC 480-90-257 (Commission Basis Report).[9] For the earnings test, the decoupling accounting entries are adjusted from a therm sales basis to a revenue per customer basis. Additional adjustments for any item that materially distorts reporting period earnings and rate base are required, following WAC 480-90-257(2)(b). The CBR includes normalizing adjustments to reflect operations under normal weather conditions. The earnings test as defined in Rule 21 is not subject to a percentage threshold. If earnings exceed allowed earnings by any amount, 50% of the excess earnings are used to either reduce the decoupling surcharge or increase the decoupling rebate.

The formal calculation for the Earnings Test (Table 1-11) shows (Line 13) no excess earnings so the 2021 Earnings Test did not have an impact on decoupling rates.

[9] Washington Administrative Code 480-90-257.

Table 1-11: CBR Earnings Test – 2021.

	2020 Commission Basis Earnings Test for Decoupling		
Line No.			Natural Gas
1	Rate Base		$ 420,487,637
2	Net Income		$ 24,683,914
3	Calculated ROR		5.87%
4	Base ROR		7.24%
5	Excess ROR		-1.37%
6	Excess Earnings		$ -
7	Conversion Factor		0.75554
8	Excess Revenue (Excess Earnings/CF)		$ -
9	Sharing %		50%
10	2020 Total Earnings Test Sharing		$ -
11	Adjusted Revenues from CBR		$ 265,512,253
12	2021 Decoupling Deferral Balance		$ 3,006,411
13	Earnings Test		1.13%

Three Percent Cap Test - 2021

The sum of the decoupling surcharge plus interest at the Federal Energy Regulatory Commission (FERC) rate cannot exceed a three percent annual rate adjustment (unrecovered balances are carried forward to future years for recovery).[10] For the deferrals from 2020, expressed as the posted Schedule 594 tariff rate effective November 1, 2020, all change amounts are decreases or very small increases, so the Three Percent cap comes into effect only for the Commercial (RS 504) Consolidated Rate Class (Column 3 in Table 1-12).

[10] Any deferred balance, either in the surcharge or rebate direction, accrues interest at the FERC interest rate consistent with gas cost deferred balances. Any decoupling rebate balance at year-end is returned to customers.

Table 1-12: Three Percent Cap Test - 2021

3% Incremental Surcharge Test							
Line	Description	Residential	Commerical	Industrial	Com-Ind	Indust. Interr.	Total WA
		503	504	505	511	570	
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col.6	Col. 7
1	Revenue From 2020 Normalized Loads and Customers at Present Billing Rates (1)	$ 132,980,825	$ 81,203,573	$ 8,959,376	$ 12,092,638	$ 1,392,481	$ 236,628,892
2	August 2021 - July 2022 Usage	130,679,417	89,120,218	11,930,578	17,432,493	2,264,179	251,426,886
3	Proposed Decoupling Recovery Rates	$0.01075	$0.02746	$0.00727	($0.05383)	$0.00282	
4	Present Decoupling Surcharge Recovery Rates	(0.00910)	(0.02414)	(0.01417)	(0.01908)	0.01199	
5	Incremental Decoupling Recovery Rates	$0.01985	$0.05160	$0.02144	($0.03475)	($0.00917)	
6	Incremental Decoupling Recovery	$ 2,593,464	$ 4,598,782	$ 255,792	$ (605,762)	$ (20,769)	6,821,506
7	Incremental Surcharge %	1.95%	5.66%	2.86%	-5.01%	-1.49%	
8	3% Test Adjustment (2)	$0	($2,162,674)	$0	$0	$0	
9	3% Test Rate Adjustment	$0.00000	($0.02427)	$0.00000	$0.00000	$0.00000	
10	Adjusted Proposed Decoupling Recovery Rates	$0.01075	$0.00319	$0.00727	($0.05383)	$0.00282	
11	Adjusted Incremental Decoupling Recovery	$ 2,593,464	$ 2,435,834	$ 255,792	$ (605,762)	$ (20,769)	$ 4,658,558
12	Adjusted Incremental Surcharge %	1.95%	3.00%	2.86%	-5.01%	-1.49%	

Notes: (1) Revenue from 2020 normalized loads and customers at present billing rates effective since November 1, 2020. (2) The carryover balances will differ from the 3% adjustment amounts due to the revednue related expese gross up p;artially offset by addtional interest on the outstanding balance durin the amortization period.

D. Deferral Year 2021, November 2022 Rate Adjustment

The Cumulative Deferral Total for twelve months ending December 31, 2021, is used in the calculation of the Rate Schedule 594 decoupling rate adjustment effective November 1, 2022.

From Cumulative Total Deferral Amounts to Rate Schedule 594 Tariffs

Cumulative deferral is developed in five steps,[11] and is calculated per rate schedule each month over 2021.

WAC-480-90-257(2)(b) requires adjustments for any item that would otherwise materially distort reporting. Each monthly deferral is subject to interest and the sum of the Deferral plus the Interest is the Monthly Deferral Total. The Cumulative Deferral Total for each month is the sum of the Monthly Deferral Total plus the Cumulative Deferral Total from the prior month. Cumulative deferral calculations are shown in Table 1-13 and Table 1-14.

[11] The five calculation steps are listed at the top of Page 1-9.

Table 1-13: Cumulative Deferral (Calendar 2021) – Part 1.

RULE 21 DECOUPLING MECHANISM

DEFERRED ACCOUNTING DETAILS - TWELVE MONTHS ENDED DECEMBER 31, 2021

	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Ammortize JE	Nov-21	Dec-21	YTD
Interest Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%		3.25%	3.25%	
Days	31	28	31	30	31	30	31	31	30	31		30	31	
4800 Residential - 503														
Customer Count by Rate Class	**197,747**	**198,046**	**198,280**	**198,337**	**198,399**	**198,332**	**198,308**	**198,481**	**198,865**	**199,652**		**200,087**	**200,510**	
CA1501 Revenue by District	**6,116,850.16**	**5,779,432.96**	**6,114,169.48**	**4,215,959.98**	**2,058,083.45**	**1,605,402.25**	**947,784.40**	**831,332.58**	**945,885.53**	**1,658,362.91**		**3,105,684.32**	**5,128,862.79**	
Unbilled - Therms	**12,651,421**	**13,677,184**	**8,870,023**	**3,671,024**	**2,344,541**	**339,559**	**1,242,836**	**1,319,541**	**2,292,851**	**6,025,339**		**11,107,830**	**18,737,908**	
Unbilled Therms & Revenue	**3,931,176.05**	**4,249,911.38**	**2,756,182.25**	**1,140,697.29**	**728,519.22**	**106,193.68**	**388,684.53**	**412,673.25**	**717,066.22**	**1,884,364.52**		**3,473,862.75**	**5,860,093.35**	
Unbilled Therms & Revenue - Prior Month	(4,103,145.22)	(3,931,176.05)	(4,249,911.38)	(2,756,182.25)	(1,140,697.29)	(728,519.22)	(106,193.68)	(388,684.53)	(412,673.25)	(717,066.22)		(1,884,364.52)	(3,473,862.75)	
Total Actual Margin Revenues	5,944,880.99	6,098,168.29	4,620,440.35	2,600,475.02	1,645,905.38	983,076.71	1,230,275.25	855,321.30	1,250,278.50	2,825,661.21		4,695,182.55	7,515,093.39	
Authorized Revenue	(7,233,585.26)	(5,674,017.90)	(4,623,889.60)	(3,179,342.11)	(1,904,630.40)	(1,213,791.84)	(975,675.36)	(978,511.33)	(1,250,860.85)	(2,876,985.32)		(5,386,342.04)	(7,240,416.10)	
Deferral Amount	(1,288,704.27)	424,150.39	(40,949.25)	(578,867.09)	(258,725.02)	(230,715.13)	254,599.89	(123,190.03)	(582.35)	(62,392.86)	1,420,894.42	**(691,159.49)**	**274,677.29**	(2,321,857.92)
Interest	(3,922.06)	(6,765.22)	(6,337.96)	(6,259.83)	(8,083.60)	(8,535.55)	(9,480.46)	(8,803.86)	(8,872.46)	(9,194.30)	38,933.39	(5,189.40)	(7,284.49)	(49,795.80)
Monthly Deferral Total	(1,292,626.33)	417,385.17	(47,287.21)	(585,126.92)	(266,808.62)	(239,250.68)	245,119.43	(131,993.89)	(9,454.81)	(71,587.16)	1,459,827.81	(696,348.89)	267,392.80	**(2,371,653.72)**
Cumulative Deferral Total	(2,713,520.75)	(2,296,135.58)	(2,343,422.79)	(2,928,549.71)	(3,195,358.33)	(3,434,609.01)	(3,189,489.58)	(3,321,483.47)	(3,330,938.28)	(3,402,525.44)	(1,942,697.63)	(2,639,046.52)	(2,371,653.72)	
4809 Industrial - 505														
Customer Count by Rate Class	**487**	**485**	**484**	**483**	**481**	**480**	**480**	**480**	**480**	**483**		**484**	**489**	
CA1501 Revenue by District - First 500	**38,050.74**	**37,388.18**	**38,860.65**	**34,424.03**	**25,179.63**	**22,084.30**	**17,723.11**	**16,117.49**	**18,716.28**	**23,617.06**		**31,068.64**	**36,970.57**	
CA1501 Revenue by District - Next 3,500	**109,209.90**	**105,193.07**	**114,092.06**	**88,630.55**	**60,574.43**	**51,299.68**	**42,848.42**	**38,395.58**	**45,843.79**	**57,135.11**		**74,385.46**	**101,879.38**	
CA1501 Revenue by District - Over 4,000	**65,801.44**	**64,135.76**	**76,141.53**	**57,126.84**	**30,008.64**	**26,177.10**	**23,789.98**	**24,792.09**	**34,748.73**	**121,666.18**		**52,494.12**	**92,321.76**	
Total Actual Margin Revenues	213,062.08	206,717.01	229,094.24	180,181.42	115,762.70	99,561.08	84,361.51	79,305.16	99,308.80	202,418.35		157,948.22	231,171.71	
Authorized Revenue	(275,442.33)	(218,832.00)	(242,135.52)	(189,746.55)	(137,137.91)	(101,659.20)	(89,908.80)	(92,371.20)	(108,672.00)	(215,147.52)		(193,570.96)	(237,688.23)	
Deferral Amount	(62,380.25)	(12,114.99)	(13,041.28)	(9,565.13)	(21,375.21)	(2,098.12)	(5,547.29)	(13,066.04)	(9,363.20)	(12,729.17)	128,396.88	(35,622.74)	(6,516.52)	(203,419.94)
Interest	(354.41)	(476.52)	(562.33)	(580.53)	(627.89)	(666.41)	(696.25)	(713.48)	(727.28)	(779.37)	3,518.14	(437.94)	(552.08)	(3,656.35)
Monthly Deferral Total	(62,734.66)	(12,591.51)	(13,603.61)	(10,145.66)	(22,003.10)	(2,764.53)	(6,243.54)	(13,779.52)	(10,090.48)	(13,508.54)	131,915.02	(36,060.68)	(7,068.60)	**(207,076.29)**
Cumulative Deferral Total	(191,131.54)	(203,723.05)	(217,326.66)	(227,472.32)	(249,475.42)	(252,239.95)	(258,483.49)	(272,263.01)	(282,353.49)	(295,862.03)	(163,947.01)	(200,007.69)	(207,076.29)	
4809 Industrial - 511														
Customer Count by Rate Class	**20**	**21**	**21**	**20**	**20**	**20**	**21**	**22**	**23**	**23**		**24**	**23**	
CA1501 Revenue by District - First 20,000	**38,185.56**	**38,415.48**	**38,646.53**	**35,281.67**	**22,070.94**	**23,657.27**	**22,962.59**	**24,621.07**	**24,243.53**	**28,094.04**		**33,239.69**	**41,568.96**	
CA1501 Revenue by District - Next 80,000	**23,820.73**	**16,914.68**	**24,284.65**	**24,103.71**	**17,514.03**	**31,084.97**	**15,605.59**	**22,154.37**	**18,999.09**	**20,143.91**		**20,504.52**	**25,422.83**	
CA1501 Revenue by District - Over 100,000	**116.84**		**995.41**	**738.59**	**305.01**	**1,894.36**	**119.85**	**1,209.94**		**9.11**		**730.38**	**52.72**	
Total Actual Margin Revenues	62,123.13	55,330.16	63,926.59	60,123.97	39,889.98	56,636.60	38,688.03	47,985.38	43,242.62	48,247.06		54,474.59	67,044.51	
Authorized Revenue	(67,647.20)	(49,093.38)	(57,722.49)	(46,279.60)	(35,322.00)	(25,204.40)	(24,793.23)	(25,881.46)	(24,005.79)	(40,071.75)		(55,922.88)	(58,487.16)	
Deferral Amount	(5,524.07)	6,236.78	6,204.10	13,844.37	4,567.98	31,432.20	13,894.80	22,103.92	19,236.83	8,175.31	(246,215.44)	(1,448.29)	8,557.35	127,281.28
Interest	679.62	601.77	685.13	681.43	744.24	734.42	847.69	888.38	921.14	1,007.49	(6,746.44)	323.80	331.49	1,700.16
Monthly Deferral Total	(4,844.45)	6,838.55	6,889.23	14,525.80	5,312.22	32,166.62	14,742.49	22,992.30	20,157.97	9,182.80	(252,961.88)	(1,124.49)	8,888.84	**128,981.44**
Cumulative Deferral Total	241,370.99	248,209.54	255,098.77	269,624.57	274,936.79	307,103.41	321,845.90	344,838.20	364,996.17	374,178.97	121,217.09	120,092.60	128,981.44	
4810 Commercial - 04LV														
Customer Count by Rate Class	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		**1**	**1**	
CA1501 - Revenue by District	**1,972.66**	**3,323.29**	**1,977.38**	**1,046.68**	**575.96**	**943.00**	**395.84**	**316.18**	**482.03**	**582.17**		**805.84**	**1,327.82**	
CA1501A - Current Month Revenue by District	**3,323.29**	**1,977.38**	**1,046.68**	**575.96**	**943.00**	**395.84**	**316.18**	**482.03**	**582.17**	**805.84**		**1,327.82**	**3,688.03**	
Prior Month CA1501A Revenue by District	1,972.66	(3,323.29)	(1,977.38)	(1,046.68)	(575.96)	(943.00)	(395.84)	(316.18)	(482.03)	(582.17)		(805.84)	(1,327.82)	
Total Actual Margin Revenues	7,268.61	1,977.38	1,046.68	575.96	943.00	395.84	316.18	482.03	582.17	805.84		1,327.82	3,688.03	
Authorized Revenue	(148.36)	(123.57)	(89.98)	(67.79)	(38.59)	(34.00)	(30.62)	(30.80)	(37.36)	(70.42)		(107.70)	(140.50)	
Deferral Amount	7,120.25	1,853.81	956.70	508.17	904.41	361.84	285.56	451.23	544.81	735.42	(12,071.15)	1,220.12	3,547.53	18,489.85
Interest	33.32	47.93	58.31	59.15	62.68	63.24	66.53	67.50	66.71	70.62	(330.76)	37.36	42.08	344.67
Monthly Deferral Total	7,153.57	1,901.74	1,015.01	567.32	967.09	425.08	352.09	518.73	611.52	806.04	(12,401.91)	1,257.48	3,589.61	**18,834.52**
Cumulative Deferral Total	19,224.72	21,126.46	22,141.47	22,708.79	23,675.88	24,100.96	24,453.05	24,971.78	25,583.30	26,389.34	13,987.43	15,244.91	18,834.52	
4810 Commercial - 11LV														
Customer Count by Rate Class	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**		**2**	**3**	
CA1501 Revenue by District - First 20,000	**6,270.70**	**6,024.17**	**6,172.08**	**5,129.41**	**4,307.81**	**3,691.70**	**576.69**	**539.68**	**578.15**	**679.17**				
CA1501 Revenue by District - Next 80,000	**7,164.96**	**6,222.78**	**6,123.26**	**3,286.86**	**1,121.27**							**4,412.01**	**8,361.28**	
CA1501 Revenue by District - Over 100,000	-											**606.76**	**3,646.97**	
CA1501A Revenue by District - First 20,000	**6,024.17**	**6,172.08**	**5,129.41**	**4,307.81**	**3,691.97**	**576.69**	**539.68**	**578.15**	**679.17**	**4,412.01**		**8,361.28**	**6,465.20**	
CA1501A Revenue by District - Next 80,000	**6,222.78**	**6,123.26**	**3,286.86**	**1,121.27**	-					**606.76**		**3,646.97**	**7,723.03**	
CA1501A Revenue by District - Over 100,000	-													
Prior Month CA1501A Revenue by District	(13,435.66)	(12,246.95)	(12,295.34)	(8,416.27)	(5,429.08)	(3,691.97)	(576.69)	(539.68)	(578.15)	(679.17)		(5,018.77)	(12,008.25)	
Total Actual Margin Revenues	12,246.95	12,295.34	8,416.27	5,429.08	3,691.97	576.42	539.68	578.15	679.17	5,018.77		12,008.25	14,188.23	
Authorized Revenue	(6,764.72)	(4,675.56)	(5,497.38)	(4,627.96)	(3,532.20)	(2,520.44)	(2,361.26)	(2,352.86)	(2,087.46)	(3,484.50)		(4,660.24)	(7,628.76)	
Deferral Amount	5,482.23	7,619.78	2,918.89	801.12	159.77	**(1,944.02)**	**(1,821.58)**	**(1,774.71)**	**(1,408.29)**	1,534.27	(595,590.74)	7,348.01	6,559.47	25,474.94
Interest	1,643.99	1,502.66	1,688.84	1,646.67	1,708.32	1,658.20	1,712.69	1,712.39	1,656.98	1,712.90	(16,319.52)	31.77	53.19	409.08
Monthly Deferral Total	7,126.22	9,122.44	4,607.73	2,447.79	1,868.09	(285.82)	(108.89)	(62.32)	248.69	3,247.17	(611,910.26)	7,379.78	6,612.66	**25,884.02**
Cumulative Deferral Total	602,716.96	611,839.40	616,447.13	618,894.92	620,763.01	620,477.19	620,368.30	620,305.98	620,554.67	623,801.84	11,891.58	19,271.36	25,884.02	

Table 1-14: Cumulative Deferral Calendar 2021 - Part 2.

4810 Commercial - 504														
Customer Count by Rate Class	**27,039**	**27,077**	**27,056**	**27,039**	**27,040**	**27,039**	**27,032**	**27,025**	**27,020**	**27,131**		**27,236**	**27,317**	
CA1501 Revenue by District	**3,389,674.65**	**3,164,546.19**	**3,455,936.30**	**2,405,627.49**	**1,296,175.17**	**1,056,344.40**	**719,588.23**	**679,563.28**	**734,778.08**	**1,047,148.69**		**1,708,911.63**	**2,838,991.79**	
Unbilled - Therms	**9,206,386**	**9,876,392**	**6,599,492**	**2,779,511**	**1,966,052**	**296,580**	**1,248,224**	**1,411,426**	**2,330,127**	**5,048,872**		**8,093,139**	**13,620,124**	
Unbilled - Percentage of 504 to Total 504+511 Therms	**0.9039**	**0.9009**	**0.9022**	**0.8928**	**0.8886**	**0.8880**	**0.8922**	**0.8954**	**0.8972**	**0.8887**		**0.8917**	**0.9037**	
Unbilled Therms & Revenue	**2,178,608.49**	**2,329,402.68**	**1,558,773.43**	**649,669.00**	**457,373.50**	**69,219.70**	**292,704.57**	**332,162.19**	**549,469.77**	**1,179,300.60**		**1,896,752.65**	**3,235,044.63**	
Unbilled Therms & Revenue - Prior Month	(2,257,289.61)	(2,178,608.49)	(2,329,402.68)	(1,558,773.43)	(649,669.00)	(457,373.50)	(69,219.70)	(292,704.57)	(332,162.19)	(549,469.77)		(1,179,300.60)	(1,896,752.65)	
Total Actual Margin Revenues	3,310,993.53	3,315,340.38	2,685,307.05	1,496,523.06	1,103,879.67	668,190.60	943,073.10	719,020.90	952,085.66	1,676,979.52		2,426,363.68	4,177,283.77	
Authorized Revenue	(4,011,506.04)	(3,345,904.89)	(2,434,498.88)	(1,832,973.81)	(1,043,473.60)	(919,326.00)	(827,719.84)	(832,370.00)	(1,009,467.20)	(1,910,565.02)		(2,933,317.20)	(3,838,038.50)	
Deferral Amount	(700,512.51)	(30,564.51)	250,808.17	(336,450.75)	60,406.07	(251,135.40)	115,353.26	(113,349.10)	(57,381.54)	(233,585.50)	2,484,120.05	(506,953.52)	339,245.27	(1,464,120.06)
Interest	(6,856.85)	(7,956.86)	(8,915.71)	(7,981.96)	(9,198.75)	(8,765.23)	(9,774.80)	(9,483.38)	(9,505.58)	(10,007.06)	68,066.28	(3,517.46)	(5,043.75)	(28,941.11)
Monthly Deferral Total	(707,369.36)	(38,521.37)	241,892.46	(344,432.71)	51,207.32	(259,900.63)	105,578.46	(122,832.48)	(66,887.12)	(243,592.56)	2,552,186.33	(510,470.98)	334,201.52	**(1,493,061.17)**
Cumulative Deferral Total	(3,191,489.41)	(3,230,010.78)	(2,988,118.32)	(3,332,551.03)	(3,281,343.71)	(3,541,244.34)	(3,435,665.88)	(3,558,498.36)	(3,625,385.48)	(3,868,978.04)	(1,316,791.71)	(1,827,262.69)	(1,493,061.17)	
4810 Commercial - 511														
Customer Count by Rate Class	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**		**72**	**72**	
CA1501 Revenue by District - First 20,000	**146,061.62**	**142,923.60**	**150,791.56**	**118,348.05**	**77,162.77**	**63,666.16**	**42,519.34**	**38,513.30**	**39,807.87**	**60,035.68**		**90,167.24**	**125,953.28**	
CA1501 Revenue by District - Next 80,000	**40,800.75**	**38,538.63**	**36,690.93**	**38,524.54**	**16,916.16**	**13,904.92**	**8,295.48**	**7,817.18**	**9,126.26**	**15,776.44**		**25,241.50**	**34,872.96**	
CA1501 Revenue by District - Over 100,000	**4,818.15**	**4,511.44**	**6,796.33**	**1,922.87**	**136.34**							**1,014.41**	**3,205.74**	
Unbilled - Therms	**9,206,386**	**9,876,392**	**6,599,492**	**2,779,511**	**1,966,052**	**296,580**	**1,248,224**	**1,411,426**	**2,330,127**	**5,048,872**		**8,093,139**	**13,620,124**	
Unbilled - Percentage of 511 to Total 504+511 Therms	**0.0961**	**0.0991**	**0.0978**	**0.1072**	**0.1114**	**0.1120**	**0.1078**	**0.1046**	**0.1028**	**0.1113**		**0.1083**	**0.0963**	
Unbilled Therms & Revenue	**110,335.18**	**122,059.91**	**80,491.58**	**37,159.09**	**27,313.73**	**4,165.08**	**16,872.35**	**18,511.95**	**30,035.54**	**70,461.53**		**109,902.70**	**164,463.78**	
Unbilled Therms & Revenue - Prior Month	(125,192.50)	(110,335.18)	(122,059.91)	(80,491.58)	(37,159.09)	(27,313.73)	(4,165.08)	(16,872.35)	(18,511.95)	(30,035.54)		(70,461.53)	(109,902.70)	
Total Actual Margin Revenues	176,823.20	197,698.40	152,710.49	115,462.97	84,369.91	54,422.43	63,522.09	47,970.08	60,457.72	116,238.11		155,864.32	218,593.06	
Authorized Revenue	(243,529.92)	(168,320.16)	(197,905.68)	(166,606.56)	(127,159.20)	(90,735.84)	(85,005.36)	(84,702.96)	(75,148.56)	(125,442.00)		(167,768.64)	(183,090.24)	
Deferral Amount	(66,706.72)	29,378.24	(45,195.19)	(51,143.59)	(42,789.29)	(36,313.41)	(21,483.27)	(36,732.88)	(14,690.84)	(9,203.89)	133,006.59	(11,904.32)	35,502.82	(271,282.34)
Interest	(367.13)	(498.83)	(472.56)	(579.31)	(741.39)	(833.75)	(964.08)	(1,026.04)	(1,093.80)	(1,173.83)	3,644.45	(798.66)	(860.35)	(5,765.28)
Monthly Deferral Total	(67,073.85)	28,879.41	(45,667.75)	(51,722.90)	(43,530.68)	(37,147.16)	(22,447.35)	(37,758.92)	(15,784.64)	(10,377.72)	136,651.04	(12,702.98)	34,642.47	**(277,047.62)**
Cumulative Deferral Total	(200,080.44)	(171,201.03)	(216,868.78)	(268,591.68)	(312,122.36)	(349,269.52)	(371,716.87)	(409,475.79)	(425,260.43)	(435,638.15)	(298,987.11)	(311,690.09)	(277,047.62)	
4811 Commercial - 05LV														
Customer Count by Rate Class	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		**1**	**1**	
CA1501 Revenue by District - First 500	-													
CA1501 Revenue by District - Next 3,500														
CA1501A Revenue by District - First 500 - Current Month														
CA1501A Revenue by District - Next 3,500 - Current Month														
Prior Month CA1501A Revenue by District - First 500	-	-	-	-	-	-	-	-	-	-		-	-	
Prior Month CA1501A Revenue by District - Next 3,500	-	-	-	-	-	-	-	-	-	-		-	-	
Total Actual Margin Revenues	-	-	-	-	-	-	-	-	-	-		-	-	
Authorized Revenue	(565.59)	(451.20)	(500.28)	(392.85)	(285.11)	(211.79)	(187.31)	(192.44)	(226.40)	(445.44)		(399.94)	(486.07)	
Deferral Amount	(565.59)	(451.20)	(500.28)	(392.85)	(285.11)	(211.79)	(187.31)	(192.44)	(226.40)	(445.44)	4,073.51	(399.94)	(486.07)	(4,344.42)
Interest	(11.24)	(11.59)	(14.11)	(15.03)	(16.66)	(16.93)	(18.12)	(18.69)	(18.65)	(19.95)	111.61	(9.37)	(10.81)	(69.54)
Monthly Deferral Total	(576.83)	(462.79)	(514.39)	(407.88)	(301.77)	(228.72)	(205.43)	(211.13)	(245.05)	(465.39)	4,185.12	(409.31)	(496.88)	**(4,413.96)**
Cumulative Deferral Total	(4,650.34)	(5,113.13)	(5,627.52)	(6,035.40)	(6,337.17)	(6,565.89)	(6,771.32)	(6,982.45)	(7,227.50)	(7,692.89)	(3,507.77)	(3,917.08)	(4,413.96)	
4813 Industrial - 570														
Customer Count by Rate Class	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**		**7**	**7**	
CA1501 Revenue by District - First 30,000	**9,501.48**	**9,348.55**	**9,464.82**	**9,121.76**	**8,320.74**	**7,666.38**	**6,376.17**	**6,226.99**	**7,208.75**	**7,729.06**		**8,713.00**	**9,249.13**	
CA1501 Revenue by District - Over 30,000	**3,900.78**	**4,066.56**	**3,755.23**	**3,768.73**	**2,471.98**	**1,641.33**	**940.29**	**582.73**	**681.03**	**1,227.92**		**2,686.53**	**3,304.95**	
CA1501A Curr Month Revenue by District - First 30,000	**9,348.55**	**9,464.82**	**9,121.76**	**8,320.74**	**7,666.38**	**6,376.17**	**6,226.99**	**7,208.75**	**7,729.06**	**8,713.00**		**9,249.13**	**10,145.36**	
CA1501A Curr Month Revenue by District - Over 30,000	**4,066.56**	**3,782.33**	**3,768.73**	**2,471.98**	**1,641.33**	**940.29**	**582.73**	**681.03**	**1,227.92**	**2,686.53**		**3,304.95**	**4,646.83**	
Prior Month CA1501A Revenue by District - First 30,000	(9,501.48)	(9,348.55)	(9,464.82)	(9,121.76)	(8,320.74)	(7,666.38)	(6,376.17)	(6,226.99)	(7,208.75)	(7,729.06)		(8,713.00)	(9,249.13)	
Prior Month CA1501A Revenue by District - Over 30,000	(3,900.78)	(4,066.56)	(3,782.33)	(3,768.73)	(2,471.98)	(1,641.33)	(940.29)	(582.73)	(681.03)	(1,227.92)		(2,686.53)	(3,304.95)	
Total Actual Margin Revenues	13,415.11	13,247.15	12,863.39	10,792.72	9,307.71	7,316.46	6,809.72	7,889.78	8,956.98	11,399.53		12,554.08	14,792.19	
Authorized Revenue	(12,716.27)	(12,262.81)	(11,932.48)	(11,839.94)	(9,864.19)	(7,121.59)	(6,898.29)	(6,527.71)	(5,091.87)	(6,060.74)		(12,661.88)	(12,521.18)	
DEFERRAL AMOUNT	698.84	984.34	930.91	(1,047.22)	(556.48)	194.87	(88.57)	1,362.07	3,865.11	5,338.79	4,603.19	(107.80)	2,271.01	13,845.87
Interest	(12.71)	(9.77)	(8.12)	(5.40)	(8.48)	(9.72)	(9.53)	(9.80)	(5.87)	4.59	126.13	31.34	32.18	114.84
Monthly Deferral Total	686.13	974.57	922.79	(1,052.62)	(564.96)	185.15	(98.10)	1,352.27	3,859.24	5,343.38	4,729.32	(76.46)	2,303.19	**13,960.71**
Cumulative Deferral Total	(3,917.06)	(2,942.49)	(2,019.70)	(3,072.32)	(3,637.28)	(3,452.13)	(3,550.23)	(2,197.96)	1,661.28	7,004.66	11,733.98	11,657.52	13,960.71	
TOTAL DEFERRAL AMOUNT	(2,111,092.09)	427,092.64	162,132.77	(962,312.97)	(257,692.88)	(490,428.96)	355,005.49	(264,387.98)	(60,055.87)	(302,573.07)	3,321,217.31	(1,239,027.97)	663,358.15	(4,079,932.75)
Interest (rounding)	(9,167.47)	(13,566.42)	(13,878.52)	(13,034.81)	(16,161.53)	(16,371.72)	(18,316.35)	(17,386.99)	(17,578.81)	(18,378.92)	91,003.28	(9,528.55)	(13,292.53)	(85,659.38)
Cumulative Deferral Total	(5,441,476.91)	(5,027,950.69)	(4,879,696.44)	(5,855,044.22)	(6,128,898.63)	(6,635,699.31)	(6,299,010.17)	(6,580,785.14)	(6,658,369.82)	(6,979,321.81)	(3,567,101.22)	(4,815,657.75)	(4,165,592.13)	**(4,165,592.13)**

Table 1-15 shows how individual rate schedules are grouped into the five Consolidated Rate Schedules used for decoupling.

Table 1-15: Consolidated Rates (November 1, 2017).

Consolidated Rates	Individual Rates
503 Residential	502, 503 Residential
504 Commercial	504, 504 Large Volume, 512 Commercial
505 Industrial Firm	505 Industrial Firm
511 Commercial-Industrial Dual Service & Large Volume	511 Commercial, 511 Industrial
570 Industrial Interruptible	570, 577 Industrial

In Table 1-16, interest assignments (Column 3) and interest accruals (Column 4) are added to the end-of-year Account Balance (Column 2) to yield a set of dollar amounts in Amount for Rate Calculation (Column 5). The dollar amount for each consolidated schedule (Column 5) is divided by forecast therms (Col. 6) to yield the Rate per Therm (Column 7) for each of the five consolidated rate schedules. The Rate per Therm (Column 7) feeds the Posted R/S 594 Tariff Rate (Table 1-17, Column 6). Table 1-16 is prior to the application of the three percent cap. Table 1-17 is after application of the three percent cap for Commercial (RS 504) and for Commercial-Industrial Dual Service (RS 511).

Table 1-16: EOY Consolidated Deferrals, Interest, & Rate per Therm – Deferral Year 2021.

DMA CALCULATION OF PER THERM RATES TO AMORTIZE DEFERRED ACCOUNTS

Line	Consolidated Account	Account Balance 12/31/2021	Interest Assignments & Amortization through 10/31/2022	Interest Accruals Through Am.	Amount for Rate Calculation	Therms Forecast	Rate per Therm
	Col. 1	Col. 2	Col. 3	Col. 4	Col 5	Col. 6	Col. 7
1	503	$ 3,602,555	$ (1,123,880)	$ 35,081.90	$ 2,513,757	131,993,811	0.01904
2	504	$ 3,956,096	$ (151,848)	$ 56,670.16	$ 3,860,918	93,567,597	0.04126
3	505	$ 277,160	$ (79,824)	$ 3,499.14	$ 200,835	12,906,568	0.01556
4	511	$ (716,794)	$ 703,780	$ (209.24)	$ (13,223)	15,549,500	(0.00085)
5	570	$ (8,172)	$ (5,591)	$ (236.30)	$ (14,000)	2,331,721	(0.00600)

Table 1-17: Posted (November 1, 2022) Rate Schedule 594 Tariff Rate.

Description	Rate Schedule	Reverse Prior Decoupling Rate Adj.	Decoupling Related Temporary Rate Adj.	Incremental R/S 594 Rate Change	Posted R/S 594 Tariff Rate
(a)	(b)	(c)	(d)	(e)	(f)
CORE MARKET RATE SCHEDULES					
Residential	503	$ (0.01075)	$ 0.01905	$ 0.00830	$ 0.01905
Commercial	504	$ (0.00319)	$ 0.03650	$ 0.03331	$ 0.03650
Industrial Firm	505	$ (0.00727)	$ 0.01556	$ 0.00829	$ 0.01556
Com-Ind Dual Service	511	$ 0.05383	$ (0.02887)	$ 0.02496	$ (0.02887)
Industrial Interr.	570	$ (0.00282)	$ (0.00600)	$ (0.00882)	$ (0.00600)

From Rate Schedule 594 Tariffs to Percent Change in Typical Monthly Bill

In Table 1-18, Therm Sales (Column 4) are forecasted therms. Revenue (Column 5) is actual revenue for the 12-month period ending July 31, 2022. This amount is the total revenue, not the adjusted amount. Per Therm Rate Change (Column 6) is the rate adjustment. The Amount of Change (Column 7) is the change in revenue (plus or minus) due to the Rate Schedule 594 adjustment. Percent Change (Column 8) is the Amount of Change (Column 7) divided by the Actual Revenue (Column 5). As shown in Line 6, Column 8 the overall Percentage Change is less than 2%.

Table 1-18: DMA Typical Monthly Therm Usage and Cost by Class.

Line	Description	Rate Schedule	Average No. of Bills	Forecasted Therms Sold	Actual Revenue	Per Therm Decoupling Change	Amount of Change	Percentage Change
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8
1	Residential	503	200,356	131,993,811	160,697,460	$ 0.00830	$ 1,094,889	0.68%
2	Commercial	504	27,210	93,567,597	103,915,277	$ 0.03331	$ 3,117,017	3.00%
3	Industrial Firm	505	487	12,906,568	11,638,460	$ 0.00829	$ 107,008	0.92%
4	Large Volume	511	99	15,549,500	12,937,587	$ 0.02496	$ 388,116	3.00%
5	Industrial Interruptible	570	7	2,331,721	1,682,022	$ (0.00882)	$ (20,575)	-1.22%
6			**228,159**	**256,349,197**	**290,870,806**		**$ 4,686,454**	1.61%

Control Tools: The Earnings Test and The Three Percent Cap

Next, the Earnings Test and the Three Percent Cap are applied to the decoupled schedules.

Earnings Test - 2022

The earnings test for the rate implemented November 1, 2022, is based on Cascade's year-end Commission Basis Report (CBR) for the previous year, presented in an average of monthly averages (AMA or "Typical Monthly" format). The CBR is prepared following the specifications

of Washington Administrative Code (WAC) 480-90-257.[12] Adjustments are required for any item that materially distorts reporting period earnings and rate base, following WAC 480-90-257(2)(b). The CBR includes normalizing adjustments to reflect operations under normal weather conditions. As shown in Table 1-19, there were no excess earnings for 2022.

Table 1-19: Earnings Test 2022.

2021 Commission Basis Earnings Test for Decoupling		
Line		**Natural Gas**
1	**Rate Base**	$ 488,393,608
2	**Net Income**	$ 24,683,914
3	**Calculated ROR**	5.05%
4	**Base ROR**	6.95%
5	**Excess ROR**	-1.90%
6	**Excess Earnings**	$ -
7	**Conversion Factor**	0.75506
8	**Excess Revenue (Excess Earnings/Conversion Factor)**	$ -
9	**Sharing %**	50%
10	**2021 Total Earnings Test Sharing**	**$** -
11	**Adjusted Revenues from CBR**	$ 286,905,704
12	**2022 Decoupling Deferral Balance**	$ 6,548,287
13	**Earnings Test**	2.28%

Three Percent Cap Test - 2022

The Cap requirement is that the sum of the decoupling surcharge plus interest at the FERC rate cannot exceed a 3 percent annual rate adjustment.[13] As shown in Table 1-20, comparing Line 7 with Line 12, the three percent cap for 2022 comes into effect only for two rate schedules, the Commercial (RS 504) and Commercial Industrial (RS 511) Consolidated Rate Classes.

[12] Washington Administrative Code 480-90-257.

[13] Any deferred balance, either in the surcharge or rebate direction, accrues interest at the FERC interest rate consistent with gas cost deferred balances. Unrecovered balances are carried forward to future years for recovery.

Three Percent Surcharge Test							
Line	Calculation Step	Residential	Commerical	Industrial	Com-Ind	Industrial Interruptible	Total WA
		503	504	505	511	570	
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 5	Col. 7
1	Revenue From 2021 Normalized Loads and Customers at Present Billing Rates (1)	$ 160,697,460	$ 103,915,277	$ 11,638,460	$ 12,937,587	$ 1,682,022	290,870,806
2	August 2022 - July 2023 Usage	131,993,811	93,567,597	12,906,568	15,549,500	2,331,721	256,349,197
3	Proposed Decoupling Recovery Rates	$0.01905	$0.04126	$0.01556	($0.00085)	($0.00600)	
4	Present Decoupling Surcharge Recovery Rate	0.01075	0.00319	0.00727	(0.05383)	0.00282	
5	Incremental Decoupling Recovery Rates	$0.00830	$0.03807	$0.00829	$0.05298	($0.00882)	
6	Incremental Decoupling Recovery	$ 1,094,889	$ 3,562,399	$ 107,008	$ 823,813	$ (20,575)	$ 5,567,534
7	Incremental Surcharge %	0.68%	3.43%	0.92%	6.37%	-1.22%	
8	3% Test Adjustment (2)	$0	($444,941)	$0	($435,685)	$0	
9	3% Test Rate Adjustment	$0.00000	($0.00476)	$0.00000	($0.02802)	$0.00000	
10	Adjusted Proposed Decoupling Recovery Rate	$0.01905	$0.03650	$0.01556	($0.02887)	($0.00600)	
11	Adjusted Incremental Decoupling Recovery	$ 1,094,889	$ 3,117,017	$ 107,008	$ 388,116	$ (20,575)	$ 4,686,455
12	Adjusted Incremental Surcharge %	0.68%	3.00%	0.92%	3.00%	-1.22%	
	Notes: (1) Revenue from 2021 normalized loads and customers at present billing rates effective since November 1, 2021. (2) The carryover balances will differ from the 3% adjustment amounts due to the revenue related expense gross up partially offset by additional interest on the outstanding balance during the amortization period.						

Table 1-20: Three Percent Test 2022.

E. Deferral Year 2022, November 2023 Rate Adjustment

From Cumulative Total Deferral Amounts to Rate Schedule 594 Tariffs

Calendar year 2022 cumulative deferral was used to develop the 2023 decoupling rate adjustment.[14] Cumulative deferral was calculated in five steps.[15] The Schedule 594 rates implemented November 1, 2023, are the final result of the calculation. Tables are shown below (Table 1-21 and Table 1-22).

[14] See response to Data Request GP-1: CNGC Advice W18-09-03 Rule 21 Decoupling WP, 09-17-2018, Tab WA-CAP 2018.

[15] The five calculation steps are listed at the top of Page 1-7.

Table 1-21: Cumulative Deferral in Calendar 2022 – Part 1.

RULE 21 DECOUPLING MECHANISM
DEFERRED ACCOUNTING DETAILS - TWELVE MONTHS ENDED DECEMBER 31, 2022

	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Amortize JE	Nov-22	Dec-22	YTD
Interest Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.60%	3.60%	3.60%	4.91%		4.91%	4.91%	
Days	31	28	31	30	31	30	31	31	30	31		30	31	
4800 Residential - 503														
Customer Count by Rate Class	200,667	200,873	201,004	201,109	201,087	201,004	200,930	200,995	201,194	201,841	Updated by	202,496	202,833	
CA1501 Revenue by District	8,049,399.09	6,107,968.15	5,899,236.01	3,888,889.79	3,282,552.12	1,979,458.59	1,116,290.98	880,761.14	863,633.43	1,173,255.37	CR 11/15/22	3,232,966.39	7,799,168.56	
Unbilled - Therms	16,216,782	14,253,820	8,456,394	8,330,002	5,057,385	2,359,004	1,155,568	1,269,341	1,686,582	4,288,708		15,295,766	18,523,640	
Unbilled Therms & Revenue	5,071,636.40	4,457,739.67	2,644,652.66	2,605,124.83	1,581,646.58	737,754.91	361,392.34	396,973.70	574,837.74	1,484,922.26		5,296,006.02	6,413,625.11	
Unbilled Therms & Revenue - Prior Month	(5,860,093.35)	(5,071,636.40)	(4,457,739.67)	(2,644,652.66)	(2,605,124.83)	(1,581,646.58)	(737,754.91)	(361,392.34)	(396,973.70)	(574,837.74)		(1,484,922.26)	(5,296,006.02)	
Total Actual Margin Revenues	7,260,942.14	5,494,071.42	4,086,149.00	3,849,361.96	2,259,073.87	1,135,566.92	739,928.41	916,342.50	1,041,497.47	2,083,339.89		7,044,050.15	8,916,787.65	
Authorized Revenue	**(6,824,684.67)**	(5,495,885.28)	(4,631,132.16)	(3,040,768.08)	(1,928,424.33)	(1,179,893.48)	(988,575.60)	(990,905.35)	(1,323,856.52)	(3,080,093.66)		(5,825,809.92)	(7,567,699.23)	
Deferral Amount	436,257.47	(1,813.86)	(544,983.16)	808,593.88	330,649.54	(44,326.56)	(248,647.19)	(657,537.16)	(282,359.05)	(996,753.77)	2,371,653.77	1,218,240.23	1,349,088.42	1,366,408.79
Interest	**(6,546.41)**	(4,841.56)	(5,378.66)	(6,675.30)	(4,685.58)	(3,662.48)	(3,699.30)	(61,562.19)	(7,073.30)	(11,175.74)	70,557.91	(5,027.02)	(135.32)	(49,904.95)
Monthly Deferral Total	429,711.06	(6,655.42)	(550,361.82)	801,918.58	325,963.96	(47,989.04)	(252,346.49)	(719,099.35)	(289,432.35)	(1,007,929.51)	2,442,211.68	1,213,213.21	1,348,953.10	**1,316,503.84**
Cumulative Deferral Total	**(1,941,942.66)**	(1,948,598.08)	(2,498,959.90)	(1,697,041.32)	(1,371,077.36)	(1,419,066.40)	(1,671,412.89)	(2,390,512.24)	(2,679,944.59)	(3,687,874.10)	(1,245,662.42)	(32,449.21)	1,316,503.89	
4809 Industrial - 505														
Customer Count by Rate Class	490	491	489	489	489	488	487	488	490	491		493	497	
CA1501 Revenue by District - First 500	40,556.51	39,396.34	40,218.70	35,791.11	33,420.52	26,008.07	18,611.81	15,739.40	17,295.27	21,903.36		33,988.20	45,777.09	
CA1501 Revenue by District - Next 3,500	125,433.83	114,589.58	115,375.11	87,508.33	79,073.12	56,570.49	37,124.48	38,039.78	41,619.14	51,373.16		76,974.84	144,243.93	
CA1501 Revenue by District - Over 4,000	120,010.13	77,028.80	104,441.18	53,286.93	58,952.30	46,173.56	31,288.68	27,371.55	38,973.82	88,987.97		51,938.94	169,577.30	
Total Actual Margin Revenues	286,000.47	231,014.72	260,034.99	176,586.37	171,445.94	128,752.12	87,024.97	81,150.73	97,888.23	162,264.49		162,901.98	359,598.32	
Authorized Revenue	**(243,490.80)**	(276,128.58)	(299,140.86)	(225,590.37)	(135,619.26)	(97,536.56)	(91,219.97)	(93,910.72)	(116,134.90)	(189,565.28)		(164,173.93)	(257,933.06)	
Deferral Amount	42,509.67	(45,113.86)	(39,105.87)	(49,004.00)	35,826.68	31,215.56	(4,195.00)	(12,759.99)	(18,246.67)	(27,300.79)	207,076.29	(1,271.95)	101,665.26	14,219.04
Interest	(571.59)	(411.71)	(581.49)	(668.75)	(828.15)	(707.94)	(717.05)	(732.06)	(748.37)	(1,133.93)	6,160.62	(351.56)	(370.05)	(1,662.03)
Monthly Deferral Total	41,938.08	(45,525.57)	(39,687.36)	(49,672.75)	34,998.53	30,507.62	(4,912.05)	(13,492.05)	(18,995.04)	(28,434.72)	213,236.91	(1,623.51)	101,295.21	**12,557.01**
Cumulative Deferral Total	(165,138.21)	(210,663.78)	(250,351.14)	(300,023.89)	(265,025.36)	(234,517.74)	(239,429.79)	(252,921.84)	(271,916.88)	(300,351.60)	(87,114.69)	(88,738.20)	12,557.01	
4809 Industrial - 511														
Customer Count by Rate Class	23	23	24	24	24	24	26	27	25	25		25	24	
CA1501 Revenue by District - First 20,000	48,274.20	43,750.17	45,399.77	34,605.63	32,825.56	27,630.81	23,432.14	23,190.99	25,700.58	31,371.76		39,009.54	46,762.33	
CA1501 Revenue by District - Next 80,000	25,718.25	21,039.94	27,858.40	20,066.41	15,663.47	22,063.37	22,910.00	18,255.65	20,696.80	27,232.10		31,578.54	18,644.45	
CA1501 Revenue by District - Over 100,000	-		162.80	129.16		1,448.29	1,887.11	2,295.87	1,236.57	427.54		3,298.20		
Total Actual Margin Revenues	73,992.45	64,790.11	73,420.97	54,801.20	48,489.03	51,142.47	48,229.25	43,742.51	47,633.95	59,031.40		73,886.28	65,406.78	
Authorized Revenue	**(65,764.36)**	(67,395.75)	(73,997.76)	(53,733.84)	(38,154.48)	(30,010.56)	(30,696.38)	(31,763.61)	(32,683.25)	(39,509.50)		(45,966.50)	(70,172.40)	
Deferral Amount	8,228.09	(2,605.64)	(576.79)	1,067.36	10,334.55	21,131.91	17,532.87	11,978.90	14,950.70	19,521.90	(128,981.44)	27,919.78	(4,765.62)	124,718.01
Interest	356.02	342.97	373.47	360.88	376.85	393.31	516.00	571.19	589.90	896.18	(3,837.26)	413.66	545.61	1,898.78
Monthly Deferral Total	8,584.11	(2,262.67)	(203.32)	1,428.24	10,711.40	21,525.22	18,048.87	12,550.09	15,540.60	20,418.08	(132,818.70)	28,333.44	(4,220.01)	**126,616.79**
Cumulative Deferral Total	137,565.55	135,302.88	135,099.56	136,527.80	147,239.20	168,764.42	186,813.29	199,363.38	214,903.98	235,322.06	102,503.36	130,836.80	126,616.79	
4810 Commercial - 04LV														
Customer Count by Rate Class	1	1	1	1	1	1	1	1	1	1		1	1	
CA1501 - Revenue by District	3,688.03	3,341.36	1,745.98	1,489.98	2,880.88	1,546.49	685.46	369.28	402.66	329.12		1,074.84	2,565.48	
CA1501A - Current Month Revenue by District	3,341.36	1,745.98	1,489.98	2,880.88	1,546.49	685.46	369.28	402.66	329.12	1,074.84		2,565.48	2,659.13	
Prior Month CA1501A Revenue by District	3,688.03	(3,341.36)	(1,745.98)	(1,489.98)	(2,880.88)	(1,546.49)	(685.46)	(369.28)	(402.66)	(329.12)		(1,074.84)	(2,565.48)	
Total Actual Margin Revenues	10,717.42	1,745.98	1,489.98	2,880.88	1,546.49	685.46	369.28	402.66	329.12	1,074.84		2,565.48	2,659.13	
Authorized Revenue	(145.25)	(115.92)	(92.36)	(60.03)	(43.76)	(30.93)	(30.62)	(30.80)	(39.96)	(73.97)		(112.14)	(144.00)	
Deferral Amount	10,572.17	1,630.06	1,397.62	2,820.85	1,502.73	654.53	338.66	371.86	289.16	1,000.87	(18,834.52)	2,453.34	2,515.13	25,546.98
Interest	51.99	73.45	86.02	87.20	98.14	99.25	115.91	117.30	114.96	163.70	(560.34)	84.85	98.27	630.70
Monthly Deferral Total	10,624.16	1,703.51	1,483.64	2,908.05	1,600.87	753.78	454.57	489.16	404.12	1,164.57	(19,394.86)	2,538.19	2,613.40	**26,177.68**
Cumulative Deferral Total	29,458.68	31,162.19	32,645.83	35,553.88	37,154.75	37,908.53	38,363.10	38,852.26	39,256.38	40,420.95	21,026.09	23,564.28	26,177.68	

Table 1-22: Cumulative Deferral in Calendar 2022 - Part 2.

RULE 21 DECOUPLING MECHANISM
DEFERRED ACCOUNTING DETAILS - TWELVE MONTHS ENDED DECEMBER 31, 2022

	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Amortize JE	Nov-22	Dec-22	YTD
Interest Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.60%	3.60%	3.60%	4.91%		4.91%	4.91%	
Days	31	28	31	30	31	30	31	31	30	31		30	31	
4810 Commercial - 11LV														
Customer Count by Rate Class	3	3	3	3	3	3	3	3	3	3		3	3	
CA1501 Revenue by District - First 20,000	9,697.80	9,697.80	9,174.44	8,256.38	8,198.52	6,674.67	1,743.83	1,194.92	1,187.82	1,673.61		6,282.06	10,661.40	
CA1501 Revenue by District - Next 80,000	12,495.25	15,145.36	9,578.04	4,655.11	3,777.25								12,810.77	
CA1501 Revenue by District - Over 100,000	-													
CA1501A Revenue by District - First 20,000	12,930.40	9,174.44	8,256.38	8,198.52	6,674.67	1,743.83	1,194.92	1,187.82	1,673.61	6,282.06		10,661.40	10,661.40	
CA1501A Revenue by District - Next 80,000	21,309.16	9,578.04	4,655.11	3,777.25								12,810.77	20,560.05	
CA1501A Revenue by District - Over 100,000	-													
Prior Month CA1501A Revenue by District	(14,188.23)	(34,239.56)	(18,752.48)	(12,911.49)	(11,975.77)	(6,674.67)	(1,743.83)	(1,194.92)	(1,187.82)	(1,673.61)		(6,282.06)	(23,472.17)	
Total Actual Margin Revenues	42,244.38	9,356.08	12,911.49	11,975.77	6,674.67	1,743.83	1,194.92	1,187.82	1,673.61	6,282.06		23,472.17	31,221.45	
Authorized Revenue	(8,577.96)	(8,790.75)	(9,249.72)	(6,716.73)	(4,769.31)	(3,751.32)	(3,541.89)	(3,529.29)	(3,921.99)	(4,741.14)		(5,515.98)	(8,771.55)	
Deferral Amount	33,666.42	565.33	3,661.77	5,259.04	1,905.36	**(2,007.49)**	**(2,346.97)**	**(2,341.47)**	**(2,248.38)**	1,540.92	(25,884.02)	17,956.19	22,449.90	78,060.62
Interest	71.45	148.65	166.54	171.40	192.10	191.51	213.65	207.13	194.13	265.03	(770.07)	156.20	236.94	1,444.66
Monthly Deferral Total	33,737.87	713.98	3,828.31	5,430.44	2,097.46	(1,815.98)	(2,133.32)	(2,134.34)	(2,054.25)	1,805.95	(26,654.09)	18,112.39	22,686.84	**79,505.28**
Cumulative Deferral Total	59,621.89	60,335.87	64,164.18	69,594.62	71,692.08	69,876.10	67,742.78	65,608.44	63,554.19	65,360.14	38,706.05	56,818.44	79,505.28	
4810 Commercial - 504														
Customer Count by Rate Class	27,318	27,347	27,339	27,249	27,206	27,170	27,165	27,153	27,154	27,241		27,459	27,570	
CA1501 Revenue by District	4,581,013.86	3,641,971.21	3,509,813.86	2,272,084.10	1,990,363.05	1,302,737.21	825,035.00	715,625.19	722,625.38	918,007.82		1,831,183.63	4,466,990.07	
Unbilled - Therms	12,043,276	11,169,111	6,607,346	6,413,811	4,060,717	2,056,705	1,121,403	1,362,124	1,858,208	4,485,589		11,435,350	14,028,311	
Unbilled - Percentage of 504 to Total 504+511 Therms	0.9147	0.9131	0.9113	0.9055	0.9024	0.8953	0.8983	0.8930	0.8965	0.8910		0.8972	0.9059	
Unbilled Therms & Revenue	2,895,331.34	2,680,475.70	1,582,571.45	1,526,439.37	963,111.89	483,966.75	264,763.38	319,700.37	477,175.53	1,158,831.57		2,974,827.85	3,684,756.22	
Unbilled Therms & Revenue - Prior Month	(3,235,044.63)	(2,895,331.34)	(2,680,475.70)	(1,582,571.45)	(1,526,439.37)	(963,111.89)	(483,966.75)	(264,763.38)	(319,700.37)	(477,175.53)		(1,158,831.57)	(2,974,827.85)	
Total Actual Margin Revenues	4,241,300.57	3,427,115.57	2,411,909.61	2,215,952.02	1,427,035.57	823,592.07	605,831.63	770,562.18	880,100.54	1,599,663.86		3,647,179.91	5,176,918.44	
Authorized Revenue	(3,967,939.50)	(3,170,064.24)	(2,525,030.04)	(1,635,757.47)	(1,190,534.56)	(840,368.10)	(831,792.30)	(856,312.40)	(1,085,073.84)	(2,015,016.77)		(3,079,252.26)	(3,970,080.00)	
Deferral Amount	273,361.07	257,051.33	(113,120.43)	580,194.55	236,501.01	(16,776.03)	(225,960.67)	(65,750.22)	(204,973.30)	(415,352.91)	1,489,061.17	567,927.65	1,206,838.44	2,079,940.49
Interest	(4,121.26)	(3,051.17)	(2,676.97)	(2,899.94)	(1,403.11)	(729.85)	(888.92)	(1,582.52)	(1,730.70)	(3,301.16)	44,419.33	1,320.49	3,738.35	27,092.57
Monthly Deferral Total	269,239.81	254,000.16	(115,797.40)	577,294.61	235,097.90	(17,505.88)	(226,849.59)	(67,332.74)	(206,704.00)	(418,654.07)	1,537,480.50	569,248.14	1,210,576.79	**2,107,033.06**
Cumulative Deferral Total	(1,223,821.36)	(969,821.20)	(1,085,618.60)	(508,323.99)	(273,226.09)	(290,731.97)	(517,581.56)	(584,914.30)	(791,618.30)	(1,210,272.37)	327,208.13	896,456.27	2,107,033.06	
4810 Commercial - 511														
Customer Count by Rate Class	72	72	72	72	72	72	72	72	72	72		72	72	
CA1501 Revenue by District - First 20,000	164,462.39	146,733.71	142,882.37	109,265.27	99,267.85	69,255.91	46,287.61	40,225.67	40,297.73	51,806.26		90,395.31	172,677.38	
CA1501 Revenue by District - Next 80,000	53,572.63	38,301.65	38,961.54	23,818.10	22,061.36	18,284.76	8,672.73	9,679.98	8,629.69	13,421.68		27,477.00	56,728.80	
CA1501 Revenue by District - Over 100,000	6,466.43	3,794.20	3,733.72	1,275.67	1,042.93	184.38						666.10	8,798.88	
Unbilled - Therms	12,043,276	11,169,111	6,607,346	6,413,811	4,060,717	2,056,705	1,121,403	1,362,124	1,858,208	4,485,589		11,435,350	14,028,311	
Unbilled - Percentage of 511 to Total 504+511 Therms	0.0853	0.0869	0.0887	0.0945	0.0976	0.1047	0.1017	0.1070	0.1035	0.1090		0.1028	0.0941	
Unbilled Therms & Revenue	128,812.02	121,703.03	73,487.57	75,999.51	49,695.32	27,001.11	14,300.35	18,275.22	26,281.21	67,565.10		162,449.81	182,419.64	
Unbilled Therms & Revenue - Prior Month	(164,463.78)	(128,812.02)	(121,703.03)	(73,487.57)	(75,999.51)	(49,695.32)	(27,001.11)	(14,300.35)	(18,275.22)	(26,281.21)		(67,565.10)	(162,449.81)	
Total Actual Margin Revenues	188,849.69	181,720.57	137,362.17	136,870.98	96,067.95	65,030.84	42,259.58	53,880.52	56,933.41	106,511.83		213,423.12	258,174.89	
Authorized Revenue	(205,871.04)	(210,978.00)	(221,993.28)	(161,201.52)	(114,463.44)	(90,031.68)	(85,005.36)	(84,702.96)	(94,127.76)	(113,787.36)		(132,385.52)	(210,517.20)	
Deferral Amount	(17,021.35)	(29,257.43)	(84,631.11)	(24,330.54)	(18,395.49)	(25,000.84)	(42,745.78)	(30,822.44)	(37,194.35)	(7,275.53)	277,047.62	81,039.60	47,657.69	(187,977.57)
Interest	(764.73)	(735.07)	(896.61)	(1,096.15)	(1,202.87)	(1,216.42)	(1,472.50)	(1,607.70)	(1,651.79)	(2,489.95)	8,242.32	(1,297.72)	(1,008.44)	(7,197.63)
Monthly Deferral Total	(17,786.08)	(29,992.50)	(85,527.72)	(25,426.69)	(19,598.36)	(26,217.26)	(44,218.28)	(32,430.14)	(38,846.14)	(9,765.48)	285,289.94	79,741.88	46,648.25	**(195,175.20)**
Cumulative Deferral Total	(294,883.70)	(324,826.20)	(410,353.92)	(435,780.61)	(455,378.97)	(481,596.23)	(525,814.51)	(558,244.65)	(597,090.79)	(606,856.27)	(321,566.33)	(241,824.45)	(195,175.20)	
4811 Commercial - 05LV														
Customer Count by Rate Class	1	1	1											
CA1501 Revenue by District - First 500	-													
CA1501 Revenue by District - Next 3,500														
CA1501A Revenue by District - First 500 - Current Month														
CA1501A Revenue by District - Next 3,500 - Current Month														
Prior Month CA1501A Revenue by District - First 500	-	-	-	-	-	-	-	-	-	-		-	-	
Prior Month CA1501A Revenue by District - Next 3,500	-	-	-	-	-	-	-	-	-	-		-	-	
Total Actual Margin Revenues	-	-	-	-	-	-	-	-	-	-		-	-	
Authorized Revenue	(496.92)	(562.38)	(611.74)	-	-	-	-	-	-	-		-	-	
Deferral Amount	(496.92)	(562.38)	(611.74)	-	-	-	-	-	-	-	4,413.96	-	-	(1,671.04)
Interest	(12.18)	(12.27)	(15.18)	(16.36)	(16.95)	(16.45)	(18.88)	(18.94)	(18.38)	(25.98)	131.32	(6.91)	(7.16)	(54.32)
Monthly Deferral Total	(509.10)	(574.65)	(626.92)	(16.36)	(16.95)	(16.45)	(18.88)	(18.94)	(18.38)	(25.98)	4,545.28	(6.91)	(7.16)	**(1,725.36)**
Cumulative Deferral Total	(4,923.06)	(5,497.71)	(6,124.63)	(6,140.99)	(6,157.94)	(6,174.39)	(6,193.27)	(6,212.21)	(6,230.59)	(6,256.57)	(1,711.29)	(1,718.20)	(1,725.36)	
4813 Industrial - 570														
Customer Count by Rate Class	7	7	7	7	7	7	7	7	7	7		7	7	
CA1501 Revenue by District - First 30,000	10,145.36	10,065.34	9,613.56	9,053.93	8,990.46	8,661.46	6,860.13	6,309.17	7,298.34	7,344.23		10,803.63	10,825.51	
CA1501 Revenue by District - Over 30,000	4,646.83	4,265.73	3,542.82	3,530.64	3,280.80	2,456.43	1,146.81	558.23	609.77	812.02		2,057.80	4,739.09	
CA1501A Curr Month Revenue by District - First 30,000	10,065.34	9,613.56	9,053.93	8,990.46	8,661.46	6,860.13	6,309.17	7,298.34	7,344.23	10,803.63		10,825.51	11,887.69	
CA1501A Curr Month Revenue by District - Over 30,000	4,265.73	3,542.82	3,530.64	3,280.80	2,456.43	1,146.81	558.23	609.77	812.02	2,057.80		4,739.09	5,538.86	
Prior Month CA1501A Revenue by District - First 30,000	(10,145.36)	(10,065.34)	(9,613.56)	(9,053.93)	(8,990.46)	(8,661.46)	(6,860.13)	(6,309.17)	(7,298.34)	(7,344.23)		(10,803.63)	(10,825.51)	
Prior Month CA1501A Revenue by District - Over 30,000	(4,646.83)	(4,265.73)	(3,542.82)	(3,530.64)	(3,280.80)	(2,456.43)	(1,146.81)	(558.23)	(609.77)	(812.02)		(2,057.80)	(4,739.09)	
Total Actual Margin Revenues	14,331.07	13,156.38	12,584.57	12,271.26	11,117.89	8,006.94	6,867.40	7,908.11	8,156.25	12,861.43		15,564.60	17,426.55	
Authorized Revenue	(14,166.25)	(14,075.39)	(14,693.91)	(13,495.30)	(11,900.42)	(8,841.77)	(6,898.29)	(6,527.71)	(6,937.49)	(6,697.60)		(12,667.27)	(15,605.10)	
DEFERRAL AMOUNT	164.82	(919.01)	(2,109.34)	(1,224.04)	(782.53)	(834.83)	(30.89)	1,380.40	1,218.76	6,163.83	(13,960.71)	2,897.33	1,821.45	7,745.95
Interest	38.54	35.31	36.66	29.94	27.64	24.73	25.83	25.82	29.14	46.28	(415.35)	11.83	24.36	(59.27)
Monthly Deferral Total	203.36	(883.70)	(2,072.68)	(1,194.10)	(754.89)	(810.10)	(5.06)	1,406.22	1,247.90	6,210.11	(14,376.06)	2,909.16	1,845.81	**7,686.68**
Cumulative Deferral Total	14,164.07	13,280.37	11,207.69	10,013.59	9,258.70	8,448.60	8,443.54	9,849.76	11,097.66	17,307.77	2,931.71	5,840.87	7,686.68	
TOTAL DEFERRAL AMOUNT	787,241.44	178,974.54	(780,079.05)	1,323,377.10	597,541.85	(35,943.75)	(506,054.97)	(755,480.12)	(528,563.13)	(1,418,455.48)	4,165,592.13	1,917,162.17	2,727,270.67	3,506,991.27
Interest (rounding)	(11,498.18)	(8,451.40)	(8,886.22)	(10,707.08)	(7,441.93)	(5,624.54)	(5,925.26)	(64,581.98)	(10,294.43)	(16,755.56)	123,928.48	(4,696.16)	3,122.53	(27,811.51)
Cumulative Deferral Total	(3,389,848.87)	(3,219,325.73)	(4,008,291.00)	(2,695,620.98)	(2,105,521.06)	(2,147,089.14)	(2,659,069.37)	(3,479,131.47)	(4,017,989.02)	(5,453,200.06)	(1,163,679.45)	748,786.56	3,479,179.76	**3,479,179.76**

In Table 1-23 interest assignments (Column 3) and interest accruals (Column 4) are added to the end-of-year balance (Column 2) to yield the dollar amounts for each schedule (Column 5). The dollar amount for each consolidated schedule (Column 5) is divided by forecast therms (Column 6) to yield the Rate per Them (Column 7) for each consolidated rate schedule. The Rate per Therm then feeds the Posted R/S 594 Tariff Rate (Table 1-24, Column 6). The values of RS 594 Rate per Therm are the same in Tables 1-23 and 1-24, except on Line 4, the Consolidated Commercial-Industrial Dual Service rate (RS 511).

Table 1-23: EOY Consolidated Deferrals, Interest, & Rate per Therm, Deferral Year 2022

Line	Consolidated Account	Account Balance 12/31/2022	Interest Assignments & Amortization through 10/31/2023	Interest Accruals Through Am.	Amount	Forecasted Therms	Rate per Therm
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
1	**503**	339,922	(1,780,524)	(45,994.46)	(1,486,596)	130,555,024	(0.01139)
2	**504**	550,349	(2,610,119)	(71,550.84)	(2,131,321)	97,016,893	(0.02197)
3	**505**	164,322	(171,679)	(295.33)	(7,653)	12,744,910	(0.00060)
4	**511**	65,580	404,036	18,028.10	487,643	(16,795,288)	(0.02903)
5	**570**	(17,806)	9,423	(342.52)	(8,726)	2,183,028	(0.00400)
6	TOTAL	1,102,366	(4,148,863)	(100,155)	(3,146,652)		

Table 1-24: Posted (November 1, 2023) Rate Schedule 594 Tariff Rate.

Line	Description	Rate Schedule	Reverse Prior Decoupling Rate Adj.	Decoupling Related Temporary Rate Adj.	Incremental R/S 594 Rate Change	Posted R/S 594 Tariff Rate
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6
1	**Residential**	503	(0.01905)	(0.01139)	(0.03044)	(0.01139)
2	**Commercial**	504	(0.03650)	(0.02197)	(0.05847)	(0.02197)
3	**Industrial Firm**	505	(0.01556)	(0.00060)	(0.01616)	(0.00060)
4	**Com-Ind Dual Se**	511	0.02887	0.00339	0.03226	0.00339
5	**Industrial Interr.**	570	0.00600	(0.00400)	0.00200	(0.00400)

Table 1-25: DMA Typical Monthly Therm Usage & Cost by Class, Deferral Year 2022.

Line No.	Description	Rate Schedule	Average # of Bills	Forecasted Therms Sold	Actual Revenue	Per Therm Decoupling Change	Amount of Change	Percentage Change
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	CORE MARKET RATE SCHEDULES							
1	Residential	503	202,519	130,555,024	189,128,913	$ (0.03044)	$ (3,973,703)	-2.10%
2	Commercial	504	27,445	97,016,893	125,824,674	$ (0.05847)	$ (5,672,481)	-4.51%
3	Industrial Firm	505	492	12,744,910	14,063,320	$ (0.01616)	$ (205,958)	-1.46%
4	Large Volume	511	100	16,795,288	18,059,049	$ 0.03226	$ 541,732	3.00%
5	Industrial Interruptible	570	7	2,183,028	2,023,502	$ 0.00200	$ 4,373	0.22%
6			**230,563**	**259,295,142**	**349,099,459**		**$ (9,306,037)**	-2.67%

Table 1-26: DMA Proposed Typical Monthly Bill by Class, Deferral Year 2022.

Line No.	Type of Service	UG-210755 Typical Monthly Therm Used	Basic Service Charge	Current 3/1/2023 Billing Rates	Current 3/1/2023 Average Bill	Proposed 11/1/2023 DMA Effects	Proposed 11/1/2023 DMA Effect Average Bill	Bill Difference	Proposed 11/1/2023 **DMA Effects** % Bill Change
					e=c+(b*d)		g=c+(b*f)		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)		
1	Residential, Schedule 503	54	$5	$1.30059	$75.23	$1.27015	$73.59	-$1.64	-2.18%
2	Commercial, Schedule 504	271	$13	$1.25728	$353.72	$1.19881	$337.88	-$15.85	-4.48%
3	Industrial Firm, Schedule 505		$60						
4	First 500 therms			$1.15619	$638.09	$1.14003	$630.01		
5	Next 3,500 therms			$1.11688	$1,666.38	$1.10072	$1,642.27		
6	Over 4,000 therms			$1.11094		$1.09478			
7	Total 505	1,992			$2,304.47		$2,272.28	-$32.19	-1.40%
8	Com-Ind Dual Service, Schedule 511		$125						
9	First 500 therms			$1.06448	$657.24	$1.09673	$673.37		
11	Next 3,500 therms			$1.02575	$3,590.11	$1.05800	$3,703.01		
12	Over 4,000 therms			$0.92994	$11,753.47	$0.96219	$12,161.14		
13	Total 511	16,639			$16,000.82		$16,537.51	$536.69	3.35%
14	Industrial Interruptible, Schedule 570		$163						
15	First 30,000 therms			$0.99783	$23,345.67	$0.99984	$23,392.21		
16	Over 30,000 therms			$0.93246		$0.93447			
17	Total 570	23,233			$23,345.67		$23,392.21	$46.54	0.20%

Control Tools: The Earnings Test and The Three Percent Cap

Next, the Earnings Test and the Three Percent Cap are applied to the decoupled schedules.

Earnings Test - 2023

The earnings test for the rate that went into effect November 1, 2023, is based on Cascade's year-end Commission Basis Report (CBR) stated on an average of monthly averages (AMA) basis and prepared subject to WAC 480-90-257 (Commission Basis Report).[16] For the earnings test, the decoupling accounting entries are adjusted from a therm sales basis to a revenue per customer basis. Additional adjustments are required for any item that materially distorts reporting period earnings and rate base, following WAC 480-90-257(2)(b). The CBR includes normalizing adjustments to reflect operations under normal weather conditions.

In Table 1-27, the Earnings Test, using information from the Commission Basis Report, shows that the difference between the Calculated ROR and the Base ROR is negative. Since there is no excess ROR (Line 5), the result of the Earnings Test does not cause modification of the 2023 rate.

[16] Washington Administrative Code 480-90-257.

Table 1-27: 2023 Earnings Test for Decoupling

Line No.				Natural Gas
1	Rate Base			$ 530,175,012
2	Net Income			$ 27,946,563
3	Calculated ROR			5.27%
4	Base ROR			6.85%
5	Excess ROR			-1.58%
6	Excess Earnings			$ -
7	Conversion Factor			0.75506
8	Excess Revenue (Excess Earnings/CF)			$ -
9	Sharing %			50%
10	2022 Total Earnings Test Sharing			**$** -
11	Adjusted Revenues from CBR			$ 134,935,407
12	2023 Decoupling Deferral Balance			$ (3,146,652)
13	Earnings Test			-2.33%

Three Percent Cap Test - 2023

After application of the Earnings Test, the last step in determination of Schedule 594 rate adjustments is calculation of the Three Percent Test (Table 1-28).

Table 1-28: Three Percent Test - 2023.

3% Incremental Surcharge Test

Line	Description	Residential	Commercial	Industrial	Com-Ind	Industrial Interruptible	Total WA
		503	504	505	511	570	
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
1	Revenue From 2022 Normalized Loads and Customers at Present Billing Rates (1)	$ 189,128,913	$ 125,824,674	$ 14,063,320	$ 18,059,049	$ 2,023,502	$ 349,099,459
2	August 2023 - July 2024 Usage	130,555,024	97,016,893	12,744,910	16,795,288	2,183,028	259,295,142
3	Proposed Decoupling Recovery Rates	($0.01139)	($0.02197)	($0.00060)	$0.02904	($0.00400)	
4	Present Decoupling Surcharge Recovery Rates	0.01905	0.03650	0.01556	(0.02887)	(0.00600)	
5	Incremental Decoupling Recovery Rates	($0.03044)	($0.05847)	($0.01616)	$0.05791	$0.00200	
6	Incremental Decoupling Recovery	$ (3,973,703)	$ (5,672,481)	$ (205,958)	$ 972,531	$ 4,373	$ (8,875,238)
7	Incremental Surcharge %	-2.10%	-4.51%	-1.46%	5.39%	0.22%	
8	3% Test Adjustment (2)	$0	$0	$0	($430,760)	$0	
9	3% Test Rate Adjustment	$0.00000	$0.00000	$0.00000	($0.02565)	$0.00000	
10	Adjusted Proposed Decoupling Recovery Rates	($0.01139)	($0.02197)	($0.00060)	$0.00339	($0.00400)	
11	Adjusted Incremental Decoupling Recovery	$ (3,973,703)	$ (5,672,481)	$ (205,958)	$ 541,732	$ 4,373	$ (9,306,037)
12	Adjusted Incremental Surcharge %	-2.10%	-4.51%	-1.46%	3.00%	0.22%	
	Notes: (1) Revenue from 2022 normalized loads and customers at present billing rates effective since November 1, 2022. (2) The carryover balances will differ from the 3% adjustment amounts due to the revenue related expense gross up partially offset by additional interest on the outstanding balance during the amortization period.						

For the Three Percent Test, the requirement is that the sum of the decoupling surcharge plus interest at the FERC rate cannot exceed a three percent annual rate adjustment.[17] As developed in the top part of Table 1-28 and shown in Line 7, an increase larger than three percent occurs only for the Consolidated Commercial-Industrial rate schedule (RS 511).

Rate adjustments which occur when the Three Percent Test is applied are shown in the bottom part of Table 1-28. In Line 12, only the Consolidated Commercial-Industrial rate RS (511) is affected by the 3% cap.

F. Summary & Conclusions – Fidelity Analysis

The purpose of the Decoupling Mechanism is to decouple the Company's Commission-authorized revenues from sales, such that the *portion of the Company's fixed costs planned for recovery through volumetric sales and not otherwise recovered from actual energy sales* will be recovered through the mechanism. In decoupling, the revenue requirement for a given year is first set. Since volumetric sales fluctuate, the difference between actual decoupling-related revenue received from customers through volumetric rates and the decoupling-related revenue approved for recovery through volumetric rates is accumulated in deferred revenue accounts.

In this section of the study, Cascade's computations of Schedule 594 rates effective November 1 of 2021, 2022 and 2023 were reviewed.[18] For each yearly rate adjustment, the Earnings Test and the Three Percent Test were checked.

- The Earnings Test did not affect Schedule 594 rates in the span of years from 2021 through 2023.
- The Three Percent Test had no effect on Residential (RS 503), Industrial (RS 505), or Interruptible (RS 570) Schedule 594 rates from 2021 through 2023.
- The Three Percent Test capped Commercial (RS 504) Schedule 594 rates in 2021 and 2022, but not in 2023.
- The Three Percent Test capped Large Volume (511) rates in 2022 and 2023, but not in 2021.

For this section of the report, we reviewed inputs; followed the computations for cumulative deferral and interest in the determination of the Schedule 594 rates; and examined the operation of the Earnings Test and the Three Percent Test for each year. Based on our analysis of cumulative decoupling data for 2020 through 2022; and the Schedule 594 Rates effective November 1 for 2021, 2022, and 2023 we find that Cascade has calculated rates and deferrals in accordance with the Commission Order approving the decoupling mechanism.

[17] Any deferred balance, either in the surcharge or rebate direction, accrues interest at the FERC interest rate consistent with gas cost deferred balances. Unrecovered balances are carried forward to future years for recovery.
[18] This report covers deferral years 2020 through 2022 with corresponding decoupling adjustment rate impacts in 2021 through 2023.

2. Billing Impacts by Rate Schedule

The primary evaluation objective of Task 2 is:

- Determine if there were any differences in decoupling tracker adjustments among the rate schedules.

Cascade's decoupling mechanism applies to all residential, commercial, and industrial customer service schedules. Each of these schedules is listed in Table 2-1.

Table 2-1: Cascade Natural Gas Retail Service Rate Schedules.

Rate Schedule	Service Description
503	Residential
504	Commercial
505	Industrial
511	Large Volume
570	Interruptible

Each of the five rate schedules listed above has been included in Cascade's decoupling mechanism since it became effective on September 1, 2016. Annual filings show the proposed decoupling mechanism adjustment (DMA) to rates through rate schedule 594 (RS 594).

A. Summary of Decoupling Mechanics

Before examining the billings impact of decoupling by rate class it is useful to take a high-level look at the mechanics of the decoupling mechanism, actual deferrals, requested recovery amounts and decoupling rates. Cascade's decoupling mechanism allows for the recovery of the difference between actual revenue and allowed revenue.[19] This difference is referred to as the decoupling deferral balance and is tracked for each of the rate schedules shown in Table 2-1.

Beginning in September 2016, monthly deferrals are accumulated over a calendar year and used with other determinants to calculate the decoupling rate required to collect or refund the under- or over-collected revenue. Decoupling rates become effective in RS 594 on November 1 of the year following the year in which deferral balances were calculated. The timing of deferral balance accumulation and decoupling rate adjustments Table 2-2 for decoupling years with an impact on deferral balances and/or decoupling rates (RS 594) over the 2020 through 2022 period, the primary focus of this study.

[19] Details of Cascade's decoupling mechanism are included in Final Order ("Order 4") and the Joint Settlement Agreement for Docket Number UG-152286 and are discussed in Section 1.

Table 2-2: Timing of Deferral Balance Accumulation and Decoupling Rate

Deferral Balance Accumulation (Calendar Year)	Decoupling Rates Effective
2018	Nov 1, 2019 – Oct 31, 2020
2019	Nov 1, 2020 – Oct 31, 2021
2020	Nov 1, 2021 – Oct 31, 2022
2021	Nov 1, 2022 – Oct 31, 2023
2022	Nov 1, 2023 – Oct 31, 2024

The three deferral years under consideration in this evaluation, 2020 through 2022, are shown in Table 2-2 along with the two prior deferral years, 2018 and 2019. Deferral balances at the end of 2018 were used, along with other determinants, to calculate the decoupling rates in effect during the rate-year November 1, 2019, through October 31, 2020. The decoupling rates (RS 594) in effect for most of 2020 (January through October), were primarily the result of deferral balances accumulated during calendar year 2018. The same process is followed in each consecutive year. Any deferral balance carried over due to the application of the three percent cap is included in the calculations of decoupling rates in effect during the next rate-year.

B. Factors Influencing Use per Customer

Cascade relies on volumetric charges to recover a portion of fixed costs for all rate groups and fuels. This causes use per customer to be an important factor in determining deferral balances and decoupling rates through the decoupling mechanism. It follows that changes in use per customer from levels assumed in the test year to set decoupled revenue will lead to positive or negative deferral balances depending on the direction of change, all other things equal. Higher use per customer will cause negative deferrals and lower use per customer will result in higher deferrals, again all other things equal.

Two key factors causing use per customer to vary from the test year are (1) actual weather deviations from normal weather and (2) acquired energy efficiency savings through Cascade programs. While there are other factors that cause actual use per customer to deviate from planning assumptions, these two are either known in the case of Cascade energy efficiency impacts or regularly measured in the case of weather impacts.

In this analysis we break down the difference between expected use per customer and actual use per customer by the change attributable to weather, energy efficiency programs, and other unidentified factors. For this purpose, expected use per customer is defined as Cascade weather normalized usage divided by the number of customers for the 12-month period that comprises the test year in effect during the decoupling calendar year. When rates were impacted by more than one rate case over the course of a decoupling year, a weighted average of test year use per customer was used to determine expected use per customer. The change in use per customer due to Cascade energy efficiency programs was calculated as the cumulative energy efficiency savings since the last applicable test year.

The change in use per customer due to weather is based on the weather adjustment reported by Cascade. Change due to "other" factors is calculated as the difference between the total change in use per customer and the change to weather and energy efficiency programs. In other words, the "other" category is what remains after accounting for weather and energy efficiency programs.

Results of these calculations are shown for two rate schedules, Residential (RS 503) and Commercial (RS 504), the two customer classes for which Cascade weather normalizes therm deliveries. Results of the analysis of changes in natural gas use per customer are visually represented in Figure 2-1 for the natural gas residential group.

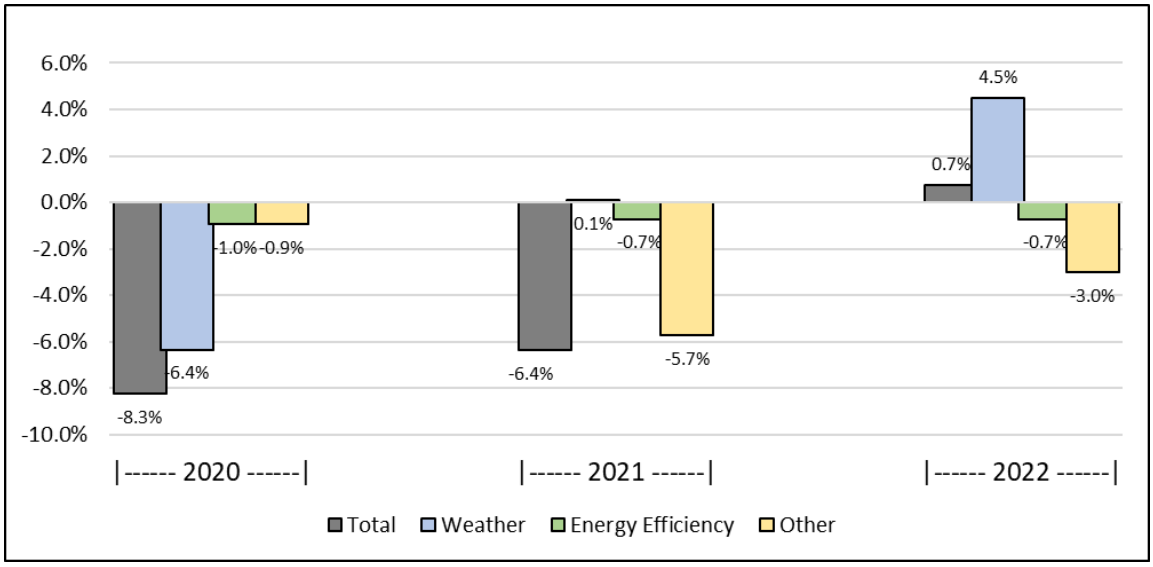

Figure 2-1: Percentage Change in Use per Customer, Residential (RS 503).

Figure 2-1 shows the percentage difference in use per residential customer relative to the test period for each of the three full calendar years covered in our analysis. Reading from left to right, the four bars in each calendar year show the total percent change followed by the three categories of change; weather, energy efficiency programs, and other unidentified factors. The sum of the categories is equal to the total change. Actual use per residential customer in 2020 was 8.3 percent lower than test year use per customer, 6.4 percent lower in 2021 and slightly higher in 2022.

Not surprisingly, the impact from warmer than normal weather was the primary source of variability in actual use per residential customer in 2020. In 2021, factors other than weather and energy efficiency were primarily responsible for the large drop in use per residential customer compared to expectations. A 4.5% increase in use per customer due to colder than normal weather in 2022 was mostly offset by reductions in use per customer due to conservation and other factors. Cascade's energy efficiency program has

resulted in a downward influence on residential use per customer in each of the three years examined. The relatively important influence of factors other than weather and conservation, especially in 2021, may reflect the shock to energy usage from the COVID-19 Pandemic.

Figure 2-2 shows a plot of total percent change in use per customer from test year assumptions for commercial customers. The contribution of each factor to the percentage change in use per customer is also shown in the plot.

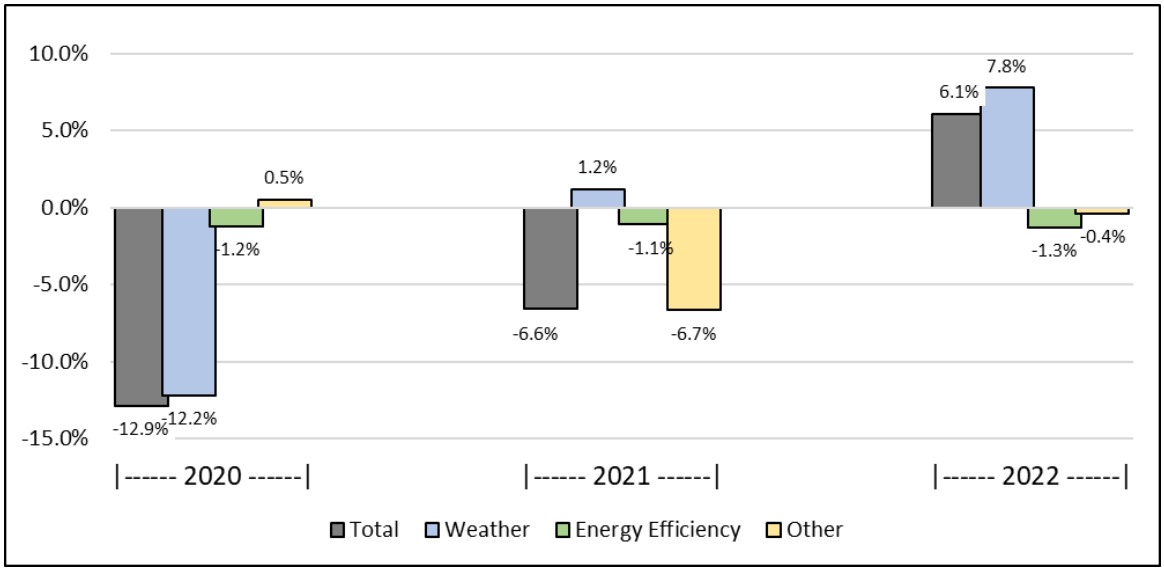

Figure 2-2: Percentage Change in Use per Customer, Natural Gas Non-Residential.

Deviations from normal weather have been the largest source of variation in use per commercial customer from test year levels. Weather impacts on use per customer appear to be the primary driver of decoupling deferrals and customer decoupling surcharges/rebates for commercial customers. In 2021, weather and conservation impacts offset each other leaving other factors to explain the 6.6 percent lower than expected use per customer. As with residential use per customer, the unusually large influence of other factors on use per customer in 2021 may reflect the COVID-19 pandemic. Cascade's energy efficiency program has resulted in consistent downward influence on commercial use per customer.[20]

[20] In this analysis we have attributed all Cascade non-residential energy efficiency to commercial customers (Rate Schedule 504). Although Cascade's annual conservation report does not breakdown non-residential energy efficiency by rate schedule, commercial customers (RS 504) account for 98% of all non-residential customers and about 74% of all non-residential retail therm deliveries over the 2020 through 2022 period.

C. Impact of Decoupling Tracker Adjustment by Customer Class

The DMA applies to all retail Cascade customers in Washington. These customers are served by one of five rate schedules. Customers, therm usage, and revenue for each of the five Washington service rate schedules in 2022 are shown in Table 2-3.

Table 2-3: Cascade 2022 Washington Customers, Usage and Revenue by Rate Schedule.

	Customers	Percent	Therms	Percent	Revenue	Percent
Residential (RS 503)	201,336	87.8%	137,525,336	51.4%	$172,882,232	54.3%
Commercial (RS 504)	27,282	11.9%	99,730,479	37.3%	$114,196,423	35.9%
Industrial (RS 505)	490	0.2%	12,268,089	4.6%	$12,626,373	4.0%
Large Volume (RS 511)	100	0.0%	16,142,022	6.0%	$15,144,916	4.8%
Interruptible (RS 570)	7	0.0%	2,054,743	0.8%	$3,549,642	1.1%
Total	**229,215**	**100.0%**	**267,720,669**	**100.0%**	**$318,399,587**	**100.0%**

Of the over 229 thousand Washington customers receiving service from Cascade in 2019, nearly 88 percent were residential, and nearly 12 percent were commercial service customers. A relatively small number of industrial, large volume and interruptible customers account for about 0.3 percent of customers and 11 percent of therms. Each of these customer classes will be reviewed below.

D. Residential (Rate Schedule 503)

Cascade's residential customer base accounted for over half (54.3%) of total billed revenue in 2022. Residential customer counts, usage, and revenue are shown for the 2020 through 2022 period. Customer charges through the decoupling mechanism adjustment rate (RS 594) are also shown in Table 1-4 both in terms of the average charge per customer and as a percentage of billed revenue.

In 2022, Cascade served over two hundred thousand residential customers in Washington. Since 2020 the number of residential customers served by Cascade has increased by about 3,000 customers annually. During this period residential throughput has fluctuated between 124.6 million therms (2020) to 137.5 million therms (2023). Annual use per customer fluctuated between 638 and 683 therms, driven mostly by weather in the short term and by efficiency improvements over the long horizon. Annual billed revenue per customer ranged between $675 and $859 over the three-year period.

Table 2-4: Annual Residential Customers, Usage, and Revenue.

Year	Customers	Billed Therms	Use per Customer	Billed Revenue	Revenue per Customer	RS 594 Charges per Customer	Percent RS 594 of Billed Revenue
2020	195,229	124,568,628	638	$131,697,705	$675	$4.72	0.7%
2021	198,754	129,211,331	650	$134,494,654	$677	-$2.10	-0.3%
2022	201,336	137,525,336	683	$172,882,232	$859	$9.18	1.1%

In 2020, residential customers were charged an average of $4.72 (0.7 percent of billed revenue) in RS 594 charges. Residential customer received a rebate in 2021 averaging $2.10 (-0.3% of the average bill) and were required to pay a surcharge of $9.18 in 2022, 1.1 percent of billed revenue.

E. Commercial (Rate Schedule 504)

Cascade's commercial customer base accounts for just under 36 percent of total 2022 billed revenue making it the second largest customer class in terms of revenue. Commercial customer counts, usage and revenue are shown in Table 2-5 for the 2020-2022 period. Customer charges through the decoupling mechanism adjustment rate (RS 594) are also shown in Table 1-5 in terms of the average charge per customer and as a percentage of billed revenue.

Cascade served over twenty-seven thousand commercial customers in Washington in 2022. Over the 2020-2022 period the number of commercial customers served by Cascade has increased annually by about three hundred customers. During this period commercial throughput has increased to just under one hundred million therms in 2022. Annual unadjusted use per customer has fluctuated between 3,044 therms (2020) and 3,656 therms (2022). While not as sensitive to weather as residential customers, commercial use per customer tends to be significantly weather related. Annual billed revenue per customer ranged between $2,945 in 2020 to $4,186 in 2022.

Table 2-5: Annual Commercial Customers, Usage and Revenue.

Year	Customers	Billed Therms	Use per Customer	Billed Revenue	Revenue per Customer	RS 594 Charges per Customer	Percent RS 594 of Billed Revenue
2020	26,766	81,484,531	3,044	$78,828,493	$2,945	-$19.62	-0.7%
2021	27,089	89,315,883	3,297	$83,307,847	$3,075	-$53.35	-1.7%
2022	27,282	99,730,479	3,656	$114,196,423	$4,186	$50.26	1.2%

The impact of decoupling on the average commercial customer's bill has ranged from a rebate of $53.35 in 2021, -1.7% of the average bill, to a customer charge of $50.26 in 2022, 1.2% of the average customer bill.

F. Industrial (Rate Schedule 505)

Cascade's Industrial customer class accounts for 4.0 percent of total 2022 billed revenue. Customer counts, usage and revenue are shown in Table 1-6 for 2020 through 2022. Customer charges through the decoupling mechanism adjustment rate (RS 594) are also shown in Table 2-6, both in terms of the average charge per customer and as a percentage of billed revenue.

Table 2-6: Annual Industrial Customers, Usage and Revenue.

Year	Customers	Billed Therms	Use per Customer	Billed Revenue	Revenue per Customer	RS 594 Charges per Customer	Percent RS 594 of Billed Revenue
2020	482	11,589,137	24,069	$9,300,540	$19,316	-$168.64	-0.9%
2021	484	11,252,956	23,250	$9,427,173	$19,478	-$257.97	-1.3%
2022	490	12,268,089	25,016	$12,626,373	$25,746	$225.79	0.9%

Cascade serves nearly five hundred industrial customers in Washington. Over the 2020 through 2022 period, customer counts in this customer class increased by six in 2022 after a small increase of only two customers in 2021. During this period industrial throughput has fluctuated between 11.3 million therms to 12.2 million in 2022. Annual unadjusted use per customer has fluctuated between a low of 23,250 therms (2021) and 25,016 therms (2022). Annual billed revenue per customer ranged between a low of $19,316 in 2020 to a high of $25,746 in 2022.

The impact of decoupling on the average industrial customer's bill has ranged from a rebate of $257.97 in 2021, -1.3% of the average bill, to a customer charge of $225.79 in 2022, 0.9% of the average customer bill.

G. Large Volume (Rate Schedule 511)

Cascade's large volume customer base accounts for 4.8 percent of total 2022 billed revenue. Customer counts, usage and revenue are shown in Table 2-7 for 2020 through 2022. Customer charges through the decoupling mechanism adjustment rate (RS 594) are also shown in Table 2-7, both in terms of the average charge per customer and as a percentage of billed revenue.

Table 2-7: Annual Large Volume Customers, Usage and Revenue.

Year	Customers	Billed Therms	Use per Customer	Billed Revenue	Revenue per Customer	RS 594 Charges per Customer	Percent RS 594 of Billed Revenue
2020	98	24,664,259	252,967	$25,234,339	$258,814	-$4,951.79	-1.9%
2021	96	14,704,207	153,837	$11,777,941	$123,222	-$3,705.11	-3.0%
2022	100	16,142,022	162,231	$15,144,916	$152,210	-$8,067.79	-5.3%

Cascade served between 96 and 100 Washington customers on the large volume rate schedule between 2020 and 2022. During this period large volume customer throughput has decreased substantially from 24.7 million therms in 2020 to between 14.7 million and 16.1 million therms in 2021 and 2022, respectively. Because of the relatively small number of customers, customers moving in and out of this customer class can cause large fluctuations in the class as a whole.

Large volume customers received a rebate through the decoupling adjustment rate (RS 594) in each of the three years under review in this study. The average customer rebate was the largest in 2022, averaging over $8,000 per customer, a 5.3% reduction in the average annual bill.

H. Interruptible (Rate Schedule 570)

Cascade's interruptible customer base accounts for just over one percent of total 2022 billed revenue. Customer counts, usage and revenue are shown in Table 2-8 for 2020 through 2022. Customer charges through the decoupling mechanism adjustment rate (RS 594) are also shown in Table 1-8, both in terms of the average charge per customer and as a percentage of billed revenue.

Table 2-8: Annual Interruptible Customers, Usage and Revenue.

Year	Customers	Billed Therms	Use per Customer	Billed Revenue	Revenue per Customer	RS 594 Charges per Customer	Percent RS 594 of Billed Revenue
2020	7	2,098,028	282,880	$2,801,670	$377,753	$4,948.63	1.3%
2021	7	2,146,144	306,592	$2,954,097	$422,014	$3,038.65	0.7%
2022	7	2,054,743	293,535	$3,549,642	$507,092	$217.68	0.0%

There has been an average of seven Washington customers in the interruptible customer class in each year over the 2020 through 2022 period. Volumes and use per customer have also been fairly consistent over the period. Billed revenue per customer varied between just under $378 thousand in 2020 to just over $507 thousand in 2022. The small number of interruptible customers makes this customer class more susceptible to volatility from changes in customer operations and customer drop-offs and additions.

Large volume customers paid a surcharge through the decoupling adjustment rate (RS 594) in each of the three years under review in this study, although that surcharge decreased each year and was near zero in 2022. In 2020, the highest surcharge to this customer class, the average interruptible customer paid nearly $5 thousand dollars in RS 594 charges, 1.3% of average annual bills.

I. Percentage Impacts on Monthly Customer Bills by Rate Schedule

The impact of the decoupling mechanism adjustment on monthly customer bills varies by decoupling rate-year and by customer class. The magnitude of the impact on customer bills is shown in percentage terms by customer class in Figure 2-3.

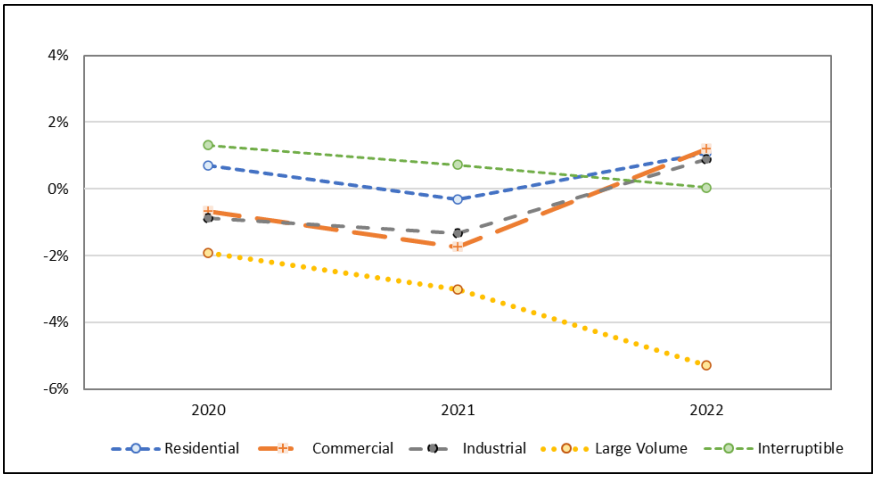

Figure 2-3: Decoupling Tariff Charges (RS 594) as Percent of Customer Bills.

Information in Figure 2-3 is the same percentage RS 594 bill impacts shown in Table 2-4 through Table 2-8 overlaid on a single chart to facilitate comparisons between customer classes over time. Changes in the percentage impact of RS 594 on customer bills over time are to be expected in the normal operation of the decoupling mechanism. Differences between customer classes are also to be expected for a number of reasons including varying degrees of weather sensitivity and differences in energy efficiency improvements.

Using the three years of decoupling results examined in this study, there are a number of patterns that emerge from the comparison of RS 594 bill impacts across customer groups. These include:

- Annual bill impacts between 2020 and 2022 from the decoupling rate adjustment (RS 594) have been both below and above zero (or near zero) for four of the five customer classes. This is to be expected with the normal operations of a decoupling mechanism.

- Large Volume is the only customer class that experienced bill impacts only in one direction, a rebate, over the three-year period. This may be a self-correcting aberration (*i.e.*, no changes to the decoupling mechanism required) or a sign that planning assumptions need to be reviewed and adjusted for this customer class.

- Annual RS 594 bill impacts fluctuate within a fairly narrow range of between roughly plus and minus one percent for all customer classes except large volume customers. This outcome suggests both good planning assumptions in the construction of the decoupling mechanism and the lack of large, unexpected changes in customer usage characteristics. This is a welcome, although somewhat surprising, result given the 2020-2022 period covers the height of COVID-19 impacts.

Examining the patterns in Figure 2-3: Decoupling Tariff Charges (RS 594) as Percent of Customer Bills, it is apparent that for the most part the impact of decoupling on customer bills has been small and within the range of expectations.

J. Summary – Billing Impacts by Rate Schedule

The examination of billing impacts shows that the decoupling adjustment mechanism has resulted in mostly small bill impacts that are within the range of expectation. During the three years of bill impacts represented in 2020, 2021, and 2022, four of the five customer classes have shown both increases and decreases (or near zero change) from RS 594 impacts on customer bills. This is part of the expected pattern in decoupling rates when year-to-year variations in weather cause both over- and under-collections of allowed revenue.

Only one customer class, large volume customers (RS 511), has shown a decrease in customer bills from decoupling in each of the three years. This customer group also experienced consistent rebates from RS-594 in the 2020 evaluation report. Unlike the previous report where use per large volume customer had been growing rapidly, it fell sharply in 2021 and 2022 from levels experienced in 2020 and earlier. This history suggests that negative rebates would turn positive when 2022 decoupling results are reported. This is in fact what happened as evidenced by the positive RS 594 rate effective November 1, 2023, for RS 511 customers shown in Table 1-24.The relatively small number of large customers in this customer class can lead to large swings in use per customer. Cascade should review to determine if an adjustment to planning assumptions is warranted for large volume customers.

3. Low-Income Weatherization

In this section, we examine Cascade's low-income weatherization work, first outlining key results and contextual factors and then looking at engagement by Cascade to solve weatherization problems.

A. Number of Households Weatherized per Year

CNGC's low-income weatherization work has been solid over many years. The graph of CNGC's Washington households weatherized by year is shown in Figure 3-1. Notable features this graph include the Great Recession during the pilot, the 2010 peak which coincided with federal stimulus funding, the start of decoupling in 2016, the Covid Recession in 2020, the more extensive an ongoing experience with Covid that began in February 2020, and the peak in 2023. The peak in 2023 coincides with working with low-income housing agencies.

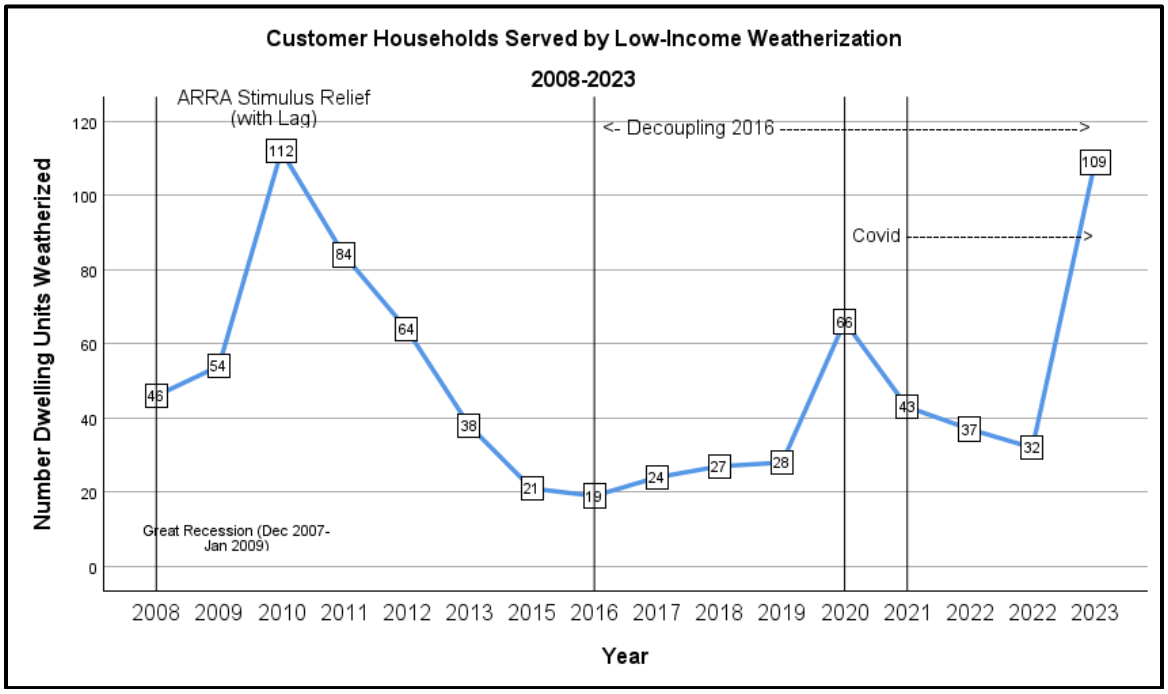

Figure 3-1: Number of Low-Income Households by Year.

Factors affecting Number of Homes

- **Recessions:** Severe recessions occurred during both the decoupling pilot and current decoupling.
    - **Great Recession:** In Figure 3-1, the Great Recession (December 2007 through June of 2009) is at the far left of the graph. The Great Recession

was the worst economic shock to the US economy since the Great Depression (August 1929 to March 1933)[21]. Cascade's initial decoupling pilot (October 2007 through October 2010 (three years)) happened to be paired with the Great Recession.

- **Covid:** At the far right of the graph (Figure 3-1), current decoupling runs from September 2016 through 2023 (eight years). The current decoupling got off to a good start prior to recession, but then happened to pair with the Covid Recession, which officially began February 29, 2020, and officially ended April 30, 2020.[22] The Covid Recession temporarily was characterized by extreme unemployment, and it took many more months than indicated by the official dates of the Covid Recession to recover to the pre-pandemic employment level. The Covid Recession was very hard on small business and gig workers, though for a while federal economic supports during part of Covid were sufficient and provided substantial relieve to low-income and moderate-income households, and temporarily reduced poverty.

- **Spike in 2010:** A likely supporting cause for reaching 112 homes in 2010, in addition to diligent work by Cascade and the community action agencies is the American Recovery and Reinvestment Act (ARRA), coordinated changes in federal weatherization guidelines, and increased federal weatherization support to community action agencies. These temporarily provided additional flexibility, and capability in the community action agencies.[23] Cascade helped meet customer needs during difficult times in the Great Recession. The federal government enacted ARRA in February 2009 (two years after the beginning of the Great Recession and four months prior to the official end of the recession). Although ARRA projects were to be "shovel ready," the new funding took months to get

[21] Official dates of the Great Depression and the many recessions do not correspond well to actual experience of businesses and households but are defined by technical rules. A beginning date usually follows negative economic effects with a lag. An end dates can be early (not matching lived experience), as the economy initially begins to improve. Negative economic experience continues beyond official end dates. We use official dates rather than social experience dates for reference since they are official. Government relief efforts follow the initial shock with a lag (relief starts late). However, relief efforts tend to continue beyond official end dates as termination dates for government assistance are usually extended. The recessions that the Great Recession was "worse than" are: February to October 1945 (war demobilization); November 1948 to October 1949 (fed raised interest rates after the war too quickly); July 1953-May 1954 (fed tightened monetary policy too much following Korean War); July 1953-May 1954 (fed monetary policy); April 1960 to February 1961 (mild economic contraction); 1973-1975 (Arab oil embargo, run on gold when the administration ended the gold standard, Nixon administration mistakes in wage-price controls); Jan-Jun 1980 and July 1981-Novmber 1982 (fed raised interest rates too much and Iranian oil embargo); July 1990-March 1991 (deregulation of savings and loan banks); March to November 2001 (government failure in regulation of dot-com industry, Y2K scare, and 9/11 attack). .

[22] https://fredblog.stlouisfed.org/2022/06/daily-recession-dates-in-fred/.

[23] Because CNGC partners with community action agencies, CNGC production for low-income weatherization is dependent federal regulations, agency authorizations, priorities, and perspectives.

through federal and state processing, and some parts were delayed for a full program year. The additional ARRA funds and program authorizations meaningfully boosted delivery capability of community action agencies. The pattern of a sharp increase in the number of households served, followed by gradual decrease tracks the phase down of relief funding as ARRA and related special funding gradually declined over following years.[24]

- **Spike in 2023**: In addition to diligent work on the part of Cascade and the agencies, the 2023 spike is likely related to the addition of groups of apartments in multifamily low-income housing. This approach enables efficiency in the use of crews and in the use of equipment.

B. Factors affecting Number of Homes Weatherized

The number of homes weatherized each year is relatively small. In the middle region of the graph (2015-2019), the number of dwelling units weatherized ranges from the middle to high twenties which is low compared with the years from 2008 through 2013. Small numbers are likely largely driven by the interaction of five factors. The first is the dramatic reduction in the supply price of natural gas over the full span of years reported in the graph (2008-2022). The second is the perverse effect of substantial reduction in commodity price on the working of benefit-cost tests. The third, fourth, and fifth are associated with service delivery. Third is Cascade's reliance on independent community action agencies responsive to federal/state weatherization programs rather than direct report for profit contractors. Fourth is that natural gas weatherization work is more complex than electric. Fifth is the increasing cost of installation of meaningful weatherization packages.

Reduction in Price of Natural Gas

For natural gas companies in the United States, a primary benefit of introduction of large quantities of fracked gas into gas supply has been a 30-40 percent drop in the commodity cost of natural gas (below the cost without new supply) due to continuing advances in extraction technologies. This price drop is a straight pass-through to customers.[25] While a sizable and meaningful benefit to all customers, cost reduction is a very meaningful benefit to low-income households due to the high portions of household income that low-income households must spend on electricity, natural gas, and water (high energy burden and high water burden).

[24] ARRA money and changes in the United States Department of Energy's Weatherization Program (WAP) meant that, temporarily, Customer Assistance Program (CAP) agencies had more flexibility, better equipment, and more staff capability. They could handle more work, until the relief funds and the relief authorizations began to dwindle and ended some years later.

[25] There are important environmental, health and climate costs to fracking but, as with energy sources, these are not priced into gas supply costs.

Perverse Effect of Lower Commodity Cost on Benefit-Cost Tests

The provision of substantially lower gas cost to customers also has the effect of lowering avoided cost of energy efficiency measures and packages in benefit-cost tests. When commodity price drops sharply, previously cost-justified weatherization measures (from before the price drop) can fail the tests and so are required to be dropped from programs.[26] This restricts the among of work that can be done across residential, commercial, and low-income programs. For low-income programs, since the full cost is covered either by the utility or through a combination of utility and government funding, it is typically necessary to provide much of the funding outside the requirements of a benefit-cost test. These costs, if "walkaways" are to be minimized, require covering health and safety costs, repairs, and rehab.

Service Delivery

Cascade works through non-profit community action agencies, rather than through for-profit construction firms or an in-house weatherization work group.[27] This form for organizing service delivery provides multiple benefits to the company and to customers (community action agencies are multiservice agencies that can link customer households to many other types of helping and social service programs). Also, melding of federal and utility funds (and other funding sources) can provide options for more completed weatherization.[28] However, community action agencies come with federal/state regulations and guidelines and organizational interests which generally, but not always, align with utility interests. In contrast, a for-profit service delivery agent has a clear reporting relationship and clearly defined accountability. This clarity comes from a single reporting relationship to the utility. The for-profit agent takes direction, priorities, and rules from the utility in a direct report relationship.[29] Direct accountability also occurs when using in-house weatherization staff, which was common when weatherization work was first initiated. When a utility works through coordination with a community action agency, it is a kind of working together in a community setting. It is inherently more social and democratic but requires skill and coordination, and accommodation of

[26] Sometimes there are bureaucratic lags and procedural factors that dampen and delay this effect.

[27] This is the pattern for utilities in Washington where it is expected that utility weatherization work is coordinated with federal and state programs and delivered through Community Action Agencies. The pattern is different in different states.

[28] Hill, Lawrence J. & Marilyn A. Brown, "Issues in Assessing the Cost-Effectiveness of Coordinated DSM Programs," *Utilities Policy*, Vol. 2, No. 1, Pp. 47-53, 1995; Hill, Lawrence J. & Marilyn A. Brown, "Estimating the Cost-Effectiveness of Coordinated DSM Programs," *Evaluation Review*, Vol. 19, No. 2, April 1995.

[29] Of course, when service delivery is organized for profit, there have been problems elsewhere with quality and completeness. For a profit-oriented service delivery agency, there can be tension between keeping up with completion targets to make profit goals and to minimize time allocation per site. This can lead to strong pressure to go light or skip time consuming on health and safety checks so as to more rapidly complete jobs. Non-profit Community Action Agencies, subject to federal and state guidelines, do not have this problem. Their goals include completeness and full implementation of health and safety guidelines and protocols. Also, the agencies have a community orientation and strong service ethic, and they can provide multiple supportive services to families in addition to weatherization.

different organizational needs. The possibilities for the utility to give direction are present but are limited in comparison to the model using for-profit direct report contractors.[30]

Community Action Agencies report primarily to the state. The state is required to pass through federal guidelines and directives for programs that are largely federally funded. Though the Community Action Agency can have an additional reporting relationship to the utility, this relationship is more joint coordination than a clear reporting relationship. Community Action Agencies come with federal, state, and agency priorities already built-in and with changing federal guidelines, transmitted through the state to the Community Action Agency. An example is described in Cascade's Annual Achievement Report for 2014 (Figure 3-2).

> The Company's Low Income Conservation Program experienced a further decline in therm achievements and number of customers…. This unanticipated decline is the direct result of the CAP agencies required adherence to increasingly stringent United States Department of Energy Weatherization Program (USDOE WAP) household prioritization rules which results in natural gas heated homes being left off of agency waiting lists in the absence of other prioritization elements such as elderly, and households with young children or disabled individuals.
>
> **2014 CNGC Annual Conservation Achievement Report, P. 3.**

Figure 3-2: Primary Reporting Relationship is to the State.

The operation of federal priorities can conflict with company service objectives (Figure 3-3).[31]

> It is … in the Company's interest to ensure as many low-income natural gas homes receive weatherization services as possible within Cascade's service area.
>
> **2015 CNGC Annual Conservation Achievement Report, P. 7.**

Figure 3-3: Company's Goal to serve as many LI Cascade households as possible.

[30] Community Action Agencies report primarily to the state and the state reports to the federal level for programs that are partially federally funded. Each agency also has its own organizational needs, and weatherization is only one of the many services it offers. Reporting to a utility through a contractual relationship or an agreement is an additional reporting relationship, while primary relationships and reporting are state and federal.

[31] In different states, some Community Action agencies control the size of waiting lists to fit practical capacity. At least one state follows federal guidelines most of the year but have added a rule that if an eligible household customer cannot be served in a given year due to the need to let other households cut in line ahead of households on the list, they will be prioritized in the following year before resuming the federal priorities. Some Community Action Agencies will drop households that have been on the list for five years if they cannot be served due to federal priorities.

The problem continued, over 2015 and into 2016 (Figure 3-4), though there was a marginal increase to twenty-four homes in 2016.

> Since the discontinuation of ARRA funds, Cascade has experienced an ongoing decrease in the number of homes served by the WAP in its Washington service area. In 2015, the number dropped to nineteen homes served and a total of 11,724 therms saved, reaching near-historical lows.
>
> **2016 Annual CNGC Conservation Achievement Report, P.6**

Figure 3-4: Decrease in Number of Homes Served Continues.

It might seem that prioritizing households with an adult aged 60 or over, a household with one or more children under the age of 6 or a household with at least one disabled individual is *neutral* as to type of energy used for household heating.[32] However, CAP agencies push down and sometimes drop homes from the waiting list when homes with a higher priority come in later, placing latecomer prioritized homes to cut in line. If there are many electric or oil heated homes in a service area that fit the federal priorities while there are fewer gas heated homes that fit the priorities, and given limited-service delivery capability, especially in years in which federal funding declines, it is quite possible for gas-heated homes to be pushed down on the list and effectively to be pushed off the list of jobs that can be started in a given year. The next year, the same thing can happen.

There is more to the prioritization situation, however, creating informal organizational incentives to deprioritize gas-heated homes. We can characterize the problem as one of complexity.

Gas is more complex. Weatherization work for natural gas heated homes is generally more complex than for electrically heated homes. Because cost-tested measures in the past were not fully covered by gas utilities (due to the lower cost advantage for natural gas), to do gas jobs, community action agencies often had to piece together funding from federal, gas utility, and other sources.

For electric homes, the electric utility (due to electricity's current higher heating cost disadvantage) can typically cover the whole cost of weatherization (the benefit-cost calculation allows full coverage). Gas furnaces and gas appliances also require more health and safety work than electric. Gas jobs are often harder to arrange, and they take more time.

If a community action agency can complete more electric jobs within the same time it takes to do fewer gas jobs, that is an incentive that can work toward doing lower numbers of gas jobs. Similarly, if electric jobs are fully funded while gas jobs require coordination of funding from different sources, with different rules, and with different timing, this can be another incentive for doing more electric jobs and fewer gas jobs. Within a given

[32] These are common core priorities for service, however, there are sometimes other priorities such as service to American Indian households and service to very high energy use households.

capability for a calendar year, it may be sensible, given federally mandated objectives, for some Community Action Agencies to schedule more electric work and less gas work. This is likely an informal factor in producing yearly job numbers as low as nineteen, and in the middle to high twenties.

C. Correlation of Number of Low-Income Households Weatherized with Therms Saved

For 2008 through 2022, the correlation of number of low-income households served and actual therms saved is: r = 0.906 (Figure 3-5). This is equivalent to a regression result of $R^2 = 0.896$. This means that while all other factors can explain about 20 percent of the variation in number of therms saved by year, the number of homes weatherized is the major factor with a very large effect size. A picture representing this amount of explanatory strength is shown in Figure 3-6.

		Confidence Intervals
	Pearson Correlation	Sig. (2-tailed)
Dwellings - Actual_Therms	.896	<.001

a. Estimation is based on Fisher's r-to-z transformation.

2008 – 2022, N=15

Figure 3-5: Correlation of Number of Households with Therms Saved (by Year).

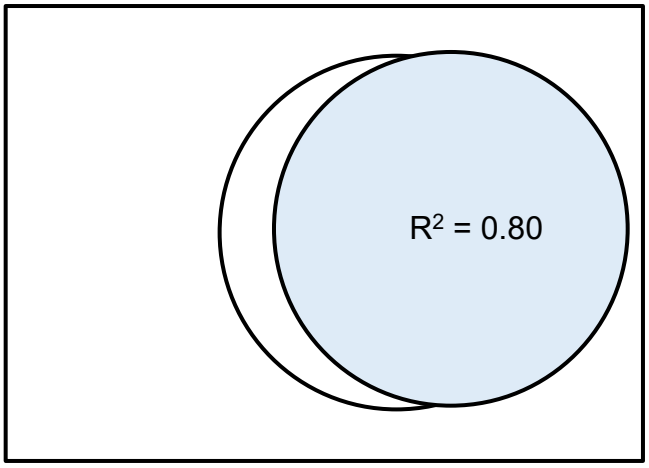

Figure 3-6: Strong Explanation of Therms Saved.

In Figure 3-6, the white circle represents number of households weatherized per year. The blue circle represents the number of therms saved per year. Their overlap is about 80 percent. This leaves about 20 percent of yearly variation in therms saved to be explained by factors other than number of households weatherized per year. The result is that four-fifths of variation is explained by number of households alone, and one-fifth (20%) by everything else. This amount of "everything else" variation (variation not explained by number of households weatherized) is represented by the white crescent to the left of the figure.

D. Therms Saved by Year & Average Therms Saved

The graph of overall low-income therms saved by year is shown in Figure 3-7.[33]

The mean therms saved per low-income dwelling unit is about 295 therms for the time window from 2008 through 2022, and ranges from sixty-seven therms to 617 therms, depending on the year (Table 3-1).

Declining savings per household is shown in Figure 3-8. Though savings per low-income household declines beginning in 2016 and this coincides with the decoupling time window, which opened in 2016, there is no logic or mechanism connecting smaller per unit low-income savings with decoupling, and this pattern does not come about for either commercial or residential energy efficiency. The increase in cost per therm beginning in 2016 is shown in Figure 3-9. Again, there is no logic or mechanism connecting this increase in cost per therm for low-income jobs to decoupling. Also, the pattern does not occur for either commercial or residential energy efficiency, as shown in Figure 3-9.

Dollar cost per Therm Saved also varies (Figure 3-9). This figure is best understood in the context of Figure 3-10 which contrasts Low-Income with Residential and Commercial.

[33] This graph has approximately the same shape as the "number of households" graph (Figure 3-1) due to the high correlation of number of homes weatherized with therms saved.

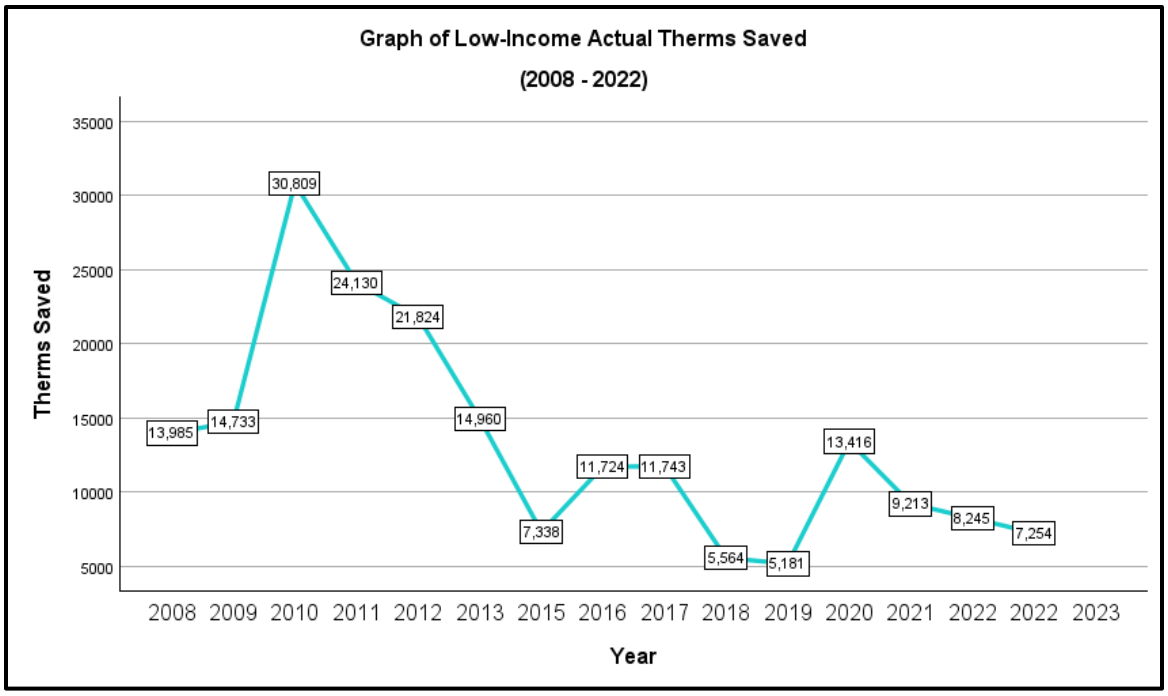

Figure 3-7: Low-Income Therms Saved by Year.

Table 3-1: Average Therm Savings per Household.

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Therms_per_DU	15	93.8%	1	6.3%	16	100.0%

Report

Therms_per_DU

Mean	N	Std. Deviation
295.18	15	133.535

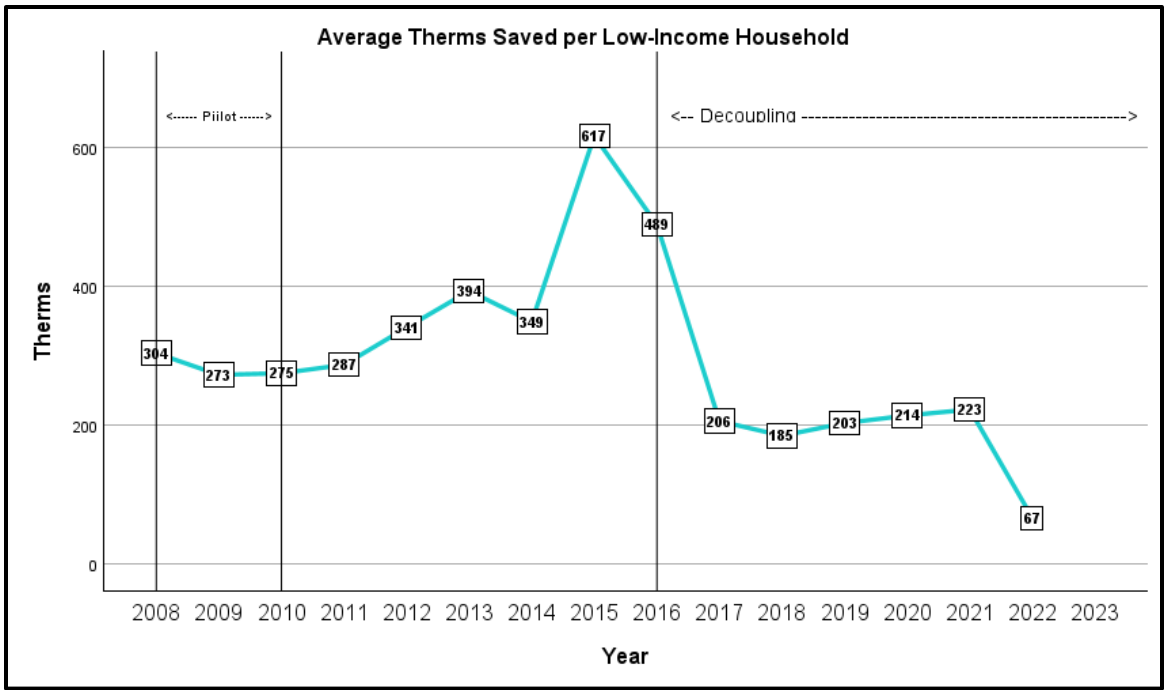

Figure 3-8: Average Savings by Year.

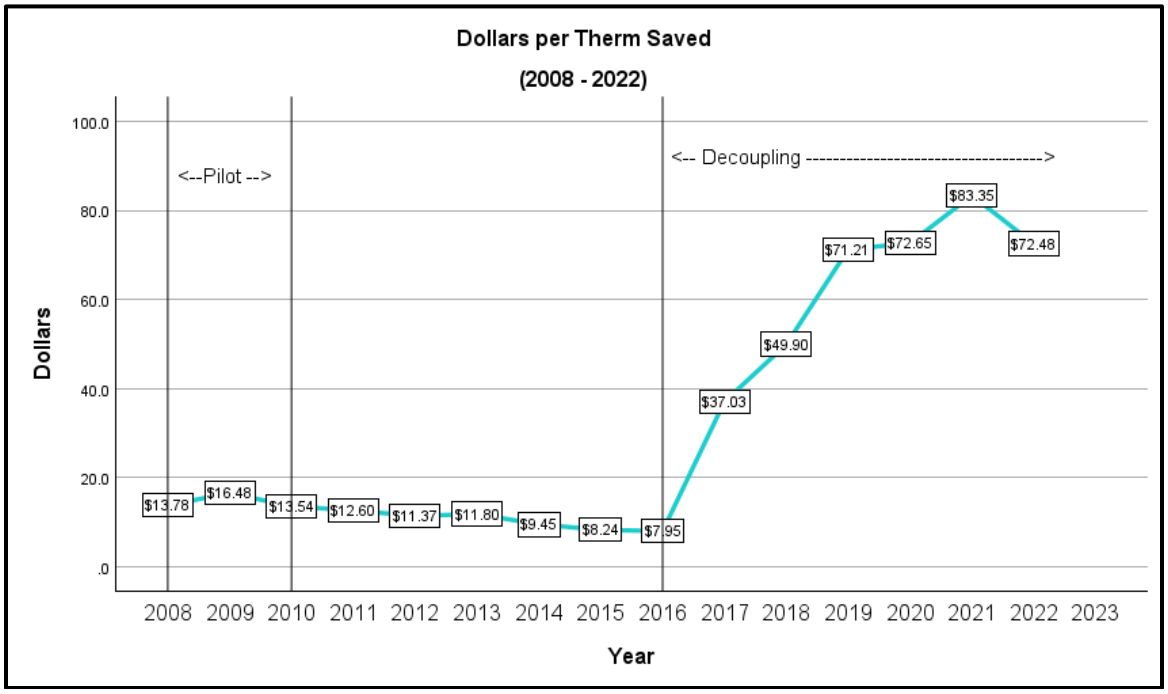

Figure 3-9: Dollars per Therm Saved (by Year).

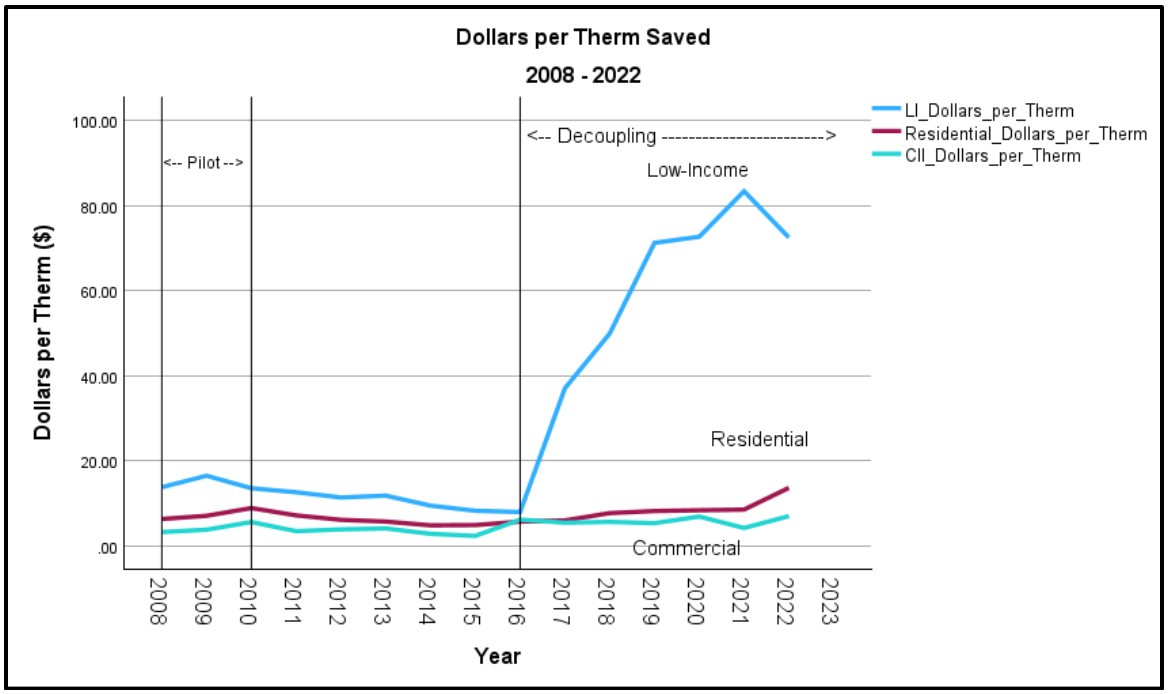

Figure 3-10: Dollars per Therm Saved (Low-Income, Residential, Commercial).

As can be seen in Figure 3-9, low-income cost per therm moves sharply up, beginning in 2016, while Residential and Commercial work continues in the same costing pattern as established from 2008 through 2016.

What happened in 2016 was testing and development of a tariff reform to enable additional dollars outside the existing framework for application to low-income homes, followed by continuing efforts by Cascade, the Conservation Advisory Group, and the Commission to enable meaningful weatherization services to low-income customers.

E. Engagement by Cascade

> The Company was directed by Commission Order No. 04, issued in Docket No. UG-15226 to develop a proposal for overcoming barriers to empowering the [CAP] agencies to serve more natural gas homes. The Order instructed the Company and stakeholders to "consider approaches that Cascade has employed in other states, such as the low-income weatherization pilot tariff currently operating in the state of Oregon."
>
> **2016 CNGC Annual Conservation Achievement Report, P. 3.**

Figure 3-11: Washington Order.

Prior to 2016, low-income weatherization funds were in a standard low-income tariff and were being collected. However, Company staff noticed that the CAP agencies were not drawing on the accumulating funds and the number of Cascade low-income weatherization jobs was continuing to drop. The innovation was developed based on investigation of barriers to natural gas weatherization projects experienced by the

Community Action Agencies, and development of a proposal to re-allocate unspent funds designated for low-income weatherization (under the existing tariff) to a new companion tariff that allowed the funds to be spent for the designated purpose, but outside the cost-benefit calculation constraints in the existing tariff. This meant that the existing tariff could continue to cover parts of a job, subject to its cost-benefit calculation constraints and the new tariff could cover the difference.[34]

The revisions include:

- Expanding the measures list to align more closely with the Washington Department of Commerce' Weatherization Priorities List
- Increasing rebate payments to cover total installed cost, with a cap of $10,000 per dwelling. This is funded by the combination of WIP and the Enhanced Weatherization Incentive Program (E-WIP).
- Adding a $550 audit reimbursement and a $300 inspection payment (with annual update to ensure CAP costs for these areas are fully recovered by the agencies).
- Adding a requirement for agencies to execute a memorandum of understanding that defines their role as program administrators and establishes annual performance target.

On August 1, 2018, additional revisions to EWIP took effect. This set of revisions was carefully designed to remove remaining barriers to serving Cascade low-income customers. Revisions include:

- Remove the $10,000 per project cap.
- Add a 15% project coordination fee.
- And a 10% indirect charge.
- Update per therm payment.
- Remove the $500 cap for health and safety.

These changes were developed by Cascade in close coordination with the weatherization agencies (Community Action Programs). In addition, Cascade provided outreach support and a number of outreach strategies were implemented with the agencies.

As a further improvement, the US Department of Energy (USDOE) permitted the Department of Commerce to retire the previous USDOE priorities list as of February 3, 2020. The Department of Commerce implemented a revised "Deemed Measures Priority List." This list serves as an alternative to the TREAT audit. All measures in the new priority list have been calculated to have a Savings to Investment ratio (SIR ratio) of one or greater, based on analysis of averaged savings data. The "Deemed Measures Priority

[34] ARRA funds provided enhance capability to CAP agencies but were disappearing and now the agencies were experiencing service constraints. Also, the innovation of new fracked gas dramatically lowered the cost of natural gas supply which had the consequence of constraining amounts that could be paid for gas weatherization measures. Electric weatherization work, due to the higher cost of electric heating, could generally be covered by electric utilities under existing cost-benefit calculations; the CAT enabled CNGC to similarly cover most job costs on a pilot basis.

List" is allowable with all weatherization funding, except USDOE funding. These changes permit more flexibility in developing an optimal set of measures for each household. Some of the key barriers encountered and the costs to remove the barriers can also be explained as a solution to the national "walkaway" problem.

F. The Cost of Solving the "Walkaway" Problem

We (HGPA) have observed, in projects in other states and provinces, and specifically in Washington, that low-income weatherization work has a serious "walkaway" problem – a large percentage of low-income homes in which weatherization work is not possible under traditional benefit-cost constraints. All states have "walkaways", but Washington, Michigan, and Pennsylvania seem to have relatively more, perhaps due to a coincidence of age of housing stock combined with changes in historical employment patterns which leave low-income families in older housing that was of good quality in its time. "Walkaways" are usually homes that need substantial repair and/or rehab before weatherization measures can be installed. For example, there are older homes built during the years of "knob and tube" wiring, and this wiring must be removed and replaced. Sometimes, for example, with a mold problem, or with a structural problem, substantial remediation to provide health and safety improvements is required. Or it can be both. A "walkaway" is a devastating thing for a low-income household; it can mean that a low-income household will become unhoused, for example, when the furnace is red tagged and there is no money for replacement, or there are holes and deterioration in parts of the building shell.

Another factor influencing cost is that deep weatherization work is becoming much more costly over time. It is not only the Covid inflation. Now, for example, a twenty-cent US postage stamp costs sixty-eight cents and prices for food have approximately doubled since the year 2000, and as a rule of thumb, costs for projects have at least doubled in dollar measure since 2000. The US is a much less resource rich country that it was, for example, prior to WWII. Nearly all US natural resources are in shorter and shorter supply so that the wood and equipment employed in weatherization has had a substantial run-up in cost.

Since at least 1980, weatherization work has been guided by benefit-cost constraints so as to do lower cost homes and less expensive measures first. The benefit-cost cap means that many low-income homes with deeper retrofit problems have not been served. If we go back to 1982, this methodological constraint makes sense. In 1982, looking forward the assumptions of benefit-cost analysis assumed a future with better funding and more capability. But we are now in that future, and, from our perspective, it would have been better if larger problems had been worked through earlier. But here we are, in the future and the technical regret and social regret are high, with major problems yet to be addressed.

At the recent ACEEE Energy Efficiency as a Resource conference in Philadelphia, the low-income panel had three presentations on the cost of weatherizing homes requiring

structural rehab and health and safety work to permit full weatherization.[35] These homes, normally "walkaways," are being addressed under the goal of social inclusion and remediation of old class and other forms of discrimination, primarily in the blue and purple states. They make up about 30% of low-income homes in Michigan and Pennsylvania. The three studies presented are consistent in finding it takes approximately $30,000 to $50,000 to successfully treat each of these homes (this is across all dwelling types, including apartments). The estimate to treat Michigan homes, developed by Guidehouse, is between $3 and $4 billion dollars. This is the cost of full standard weatherization, including health and safety remediation and repairs/rehabilitation; it does not include costs of making homes climate hardened for resilience. Washington has a similar "walkaway" and cost problem.

G. Summary

Working with the Conservation Advisory Group and the Community Action Agencies, Cascade continues to adapt to challenges inherent in low-income energy efficiency in the US. There is a low-income weatherization cost problem that coincides with decoupling, but the reasons for the size of the problem have to do with the old benefit-cost tests from the DSM era, the cumulative problem of "walkaways," and cost inflation. The cost challenge is not related to decoupling and is occurring throughout the US and Canada.

[35] Each of the three low-income session presentations is focused on the problem of weatherizing low-income homes, and, specifically, the approximately one-third of low-income homes that require substantial rehab and/or health and safety remediation prior to installing the weatherization measures. These are homes that would normally be treated as "walkaways" and not counted as completed, or homes that might be given minimal measures and counted as completions. The framework running on 'least-cost, first" for fifty years automatically accumulates an extensive list of higher cost projects put off to the future. We are now in the future. Costs include bringing homes to current weatherization standards, but do not include new climate adaption measures. Minor-Baetens works for Guidehouse. Popkin is weatherization manager for the Philadelphia Gas Works, and Goodgal is policy manager for an association of weatherization companies in Pennsylvania. Minor-Baetens does studies, Popkin makes things work on the ground, and Goodgal works on getting the policy right and the money moving. Generally, these initial projects require special funding, exception from traditional benefit-cost tests, and pooling funds from different sources. The federal government ran a pilot for some of these homes, with full funding, and some states have followed up with state funding. The balance is pooled from utilities and foundation grants. The thing is, when advocates say "just weatherize low-income homes and electrify" the intent is good, but the tacit knowledge is missing. Cost is a high multiple per dwelling unit of what passes a DSM era benefit-cost test, which it turns out was short-sighted and did not properly value the future (where we are now). So, if we want to do it all we have to change from a least-cost, first approach and actually do it all. Minor-Baetens, Jessica, "Home Repair as a Prerequisite to Energy Efficiency Equity in Michigan;" Popkin, Zachaery, Joshua Smith & Alon Abrahamson, "Health and Safety Solutions for Low-Income Philadelphians; Goodgal, Rachel, "Whole-Home Repairs – Pathway to Energy Equity in Pennsylvania." Presentations to the ACEEE Energy Efficiency as a Resource Conference, Philadelphia, Pennsylvania, October 2023. Presentations at: EER23 Program (Presentation Links)_0.pdf (aceee.org). See Session 5B (Low-Income).

4. Low-Income Billing Impacts and Contrasts

In this section the billing impacts of the decoupling mechanism adjustment on low-income customers is examined. We also contrast those impacts with the residential customer class as a whole. The following objectives are addressed in this section:

- Summarize annual rate impacts of the decoupling tariff (RS 594) on the group of customers identified by Cascade as low-income.
- Compare and contrast the average impact of the decoupling tariff (RS 594) on low-income customers and Cascade's residential customer class as a whole.

A good place to start the discussion is with the question of how to operationally define Cascade's low-income customers. Because this section relies on customer billing records, it is essential to have a definition of low-income that can be applied to the customer information system. We refer to this group as the known low-income population. It includes customers who have received bill payment assistance through one or more of the following programs: the Washington Energy Assistance Fund (WEAF), the Federal Low-Income Heating Energy Assistance Program (LIHEAP) or the Cascade's Winter Help program"[36].

For the purposes of this section, we use the known low-income population for analysis and comparison to the residential customer class as a whole. Cascade pulled account-specific billing records for these low-income customers from their customer information system. Customer usage and revenue information was included for billing periods for which the customer participated in one or more low-income programs. Annual average low-income customer counts summarized from the account-level data provided are shown in Table 4-1 below. Total residential customer counts as reported in Section 2 are also shown in Table 4-1.

Table 4-1. Cascade Residential and Low-Income Customer Counts by Calendar Year

Year	Residential	Low-Income	Percent
2020	195,229	4,527	2.3%
2021	198,754	4,620	2.3%
2022	201,336	4,362	2.2%

The number of low-income customers on the Cascade system was highest in 2021 (4,620), a year after the start of the Pandemic, and then fell in 2022 to 4,362 customers.

[36] The Weatherization program is discussed in more detail in Section 3 of this report, Low-Income Weatherization. It is understood that the low-income population is much larger than the numbers of participant households in the referenced programs and that the population of "income insufficient" households is much larger than the population of households living in poverty as defined by federal poverty level guidelines.

These fluctuations are small with the count of known low-income customers ranging from 2.2 to 2.3 percent of the residential customer base.

Our reporting and analysis of decoupling rate impacts for known low-income customers includes a comparison to the residential customer class on average and begins with a review of average annual usage per customer.

A. Average Use per Customer – Annual Comparison

Due to the influence of use per customer on decoupling deferral balances, we begin our discussion with a comparison between low-income and all residential use per customer. Figure 4-1 shows natural gas use per customer for all residential and low-income customers.

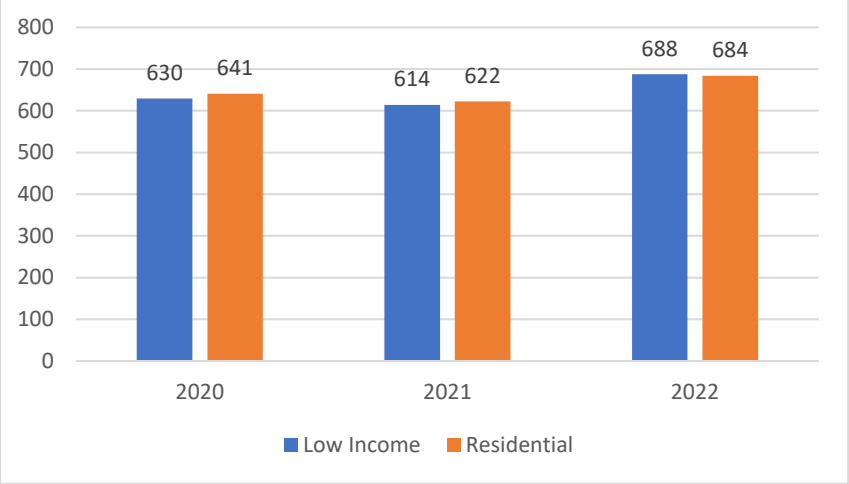

Figure 4-1. Annual Natural Gas Use per Customer, Low-Income and Average Residential

Natural gas use per low-income customer was slightly lower than the average residential customer in 2020 and 2021 and slightly higher in 2022. Considering the change in usage between 2021 and 2022, when annual weather changed from warmer than normal to colder than normal, average customer usage went up 12.0% for low-income customers compared to 9.9% for residential customers overall. The higher response in usage to colder weather in low-income customers may be due to older and less efficient housing stock relative to other residential customers. Overall, the use per customer of low-income customers is very comparable to residential customers as a whole. This means that low-income natural gas customers will have about the same exposure to decoupling rebates and surcharges through RS 594, which are volumetric charges, as the average residential customer.

Average customer revenue and decoupling tariff revenue from RS 594 is shown in Table 4-2 for 2020, 2021 and 2022.

Table 4-2. Comparison of Average Annual Billed Revenue per Customer

Customer Group	2020 Calendar Year			2021 Calendar Year			2022 Calendar Year		
	Revenue	Schedule 594 Revenue	Percent of Bill	Revenue	Schedule 594 Revenue	Percent of Bill	Revenue	Schedule 594 Revenue	Percent of Bill
Low-Income	$666	$6.09	0.9%	$669	-$3.89	-0.6%	$856	$8.34	1.0%
All Residential	$675	$4.72	0.7%	$677	-$2.10	-0.3%	$859	$9.18	1.1%
Difference	-$9	$1.37	0.2%	-$7	-$1.79	-0.3%	-$3	-$0.84	-0.1%

Over the three-year period shown in Table 4-2, average annual revenue, and decoupling revenue (RS 594) per customer were remarkably close. The average annual low-income customer bill over this three-year period was $6.46 lower than the average annual customer bill for all residential customers. Low-income customers paid an average of $0.42 less in RS 594 charges than did residential customers overall. Although small differences are present in each year, due in part to fluctuations in the timing of billed revenues, there is no meaningful difference between the bill impacts of low-income customers when compared to the residential customer class as a whole.

B. Summary – Low-Income Billing Impacts

The decoupling deferral tracker adjustment (RS 594) has had a relatively small impact on low-income customer bills. In 2020 the average low-income customer paid $6.66 in RS 594 charges, 0.9% of their annual bill. Low-income customers received a rebate in 2021 through RS 594 averaging $3.89 per customer, -0.6% of their annual bill. A positive RS 594 rate coupled with colder than normal weather led to an average RS 594 charge of $8.34 in 2022, the highest over the three-year period.

In some years over the 2020-2022 period low-income customers paid more and some years they received a higher rebate than residential customers as a whole. Considering the three years overall, there was no meaningful difference between payments through the decoupling rate (RS 594) between low-income customers and residential customers as a whole.

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5. Conservation

This section on energy conservation programs is focused on conservation portfolio spending and conservation achievement during decoupling (2016 through current data).

An argument sometimes put forward against decoupling is that, while decoupling may remove the major disincentive to energy conservation, it does not incent energy conservation so conservation effort might lag during decoupling. If this argument were correct, then utility work towards energy conservation and energy efficiency would remain stable or diminish during decoupling.

Here we look first at conservation spending, then at conservation achievement, and then report the planning projections for savings in the remaining decoupling years.

A. Conservation Programs

In this section of the study, we include overall energy conservation, and the breakout into residential conservation and commercial (including industrial) conservation. Low-income weatherization (in comparison with residential) is covered in Section 3.

B. Conservation Portfolio Spending

Cascade's overall conservation portfolio spending by year is graphed in Figure 5-1: Overall Conservation Portfolio Spending by Year. As shown in the graph, overall conservation portfolio spending moved up both in the prior pilot decoupling (2008-2010) and in the current decoupling (2016-2022).[37] *Conservation spending is the substantive variable over which Cascade has the most control.*

[37] If we consider planning targets, conservation achievement (therms saved), and conservation spending as indicators for level of effort, *conservation spending is the most important indicator* because CNGC has control of spending and spending indicates practical effort. Conservation achievement also represents practical effort, but CNGC has much less control of this variable because for both commercial and residential sectors the job mixes, measure mixes, and cost-benefit rules can vary considerably from year to year, and since Covid cost to achieve conservation objectives has been increasing. Achievement represents practical effort, but as mediated by engagement with many real-world contingencies. Planning represents intent, but of the three variables (planning, therms saved, and conservation spending) it is likely the weakest indicator of level of effort.

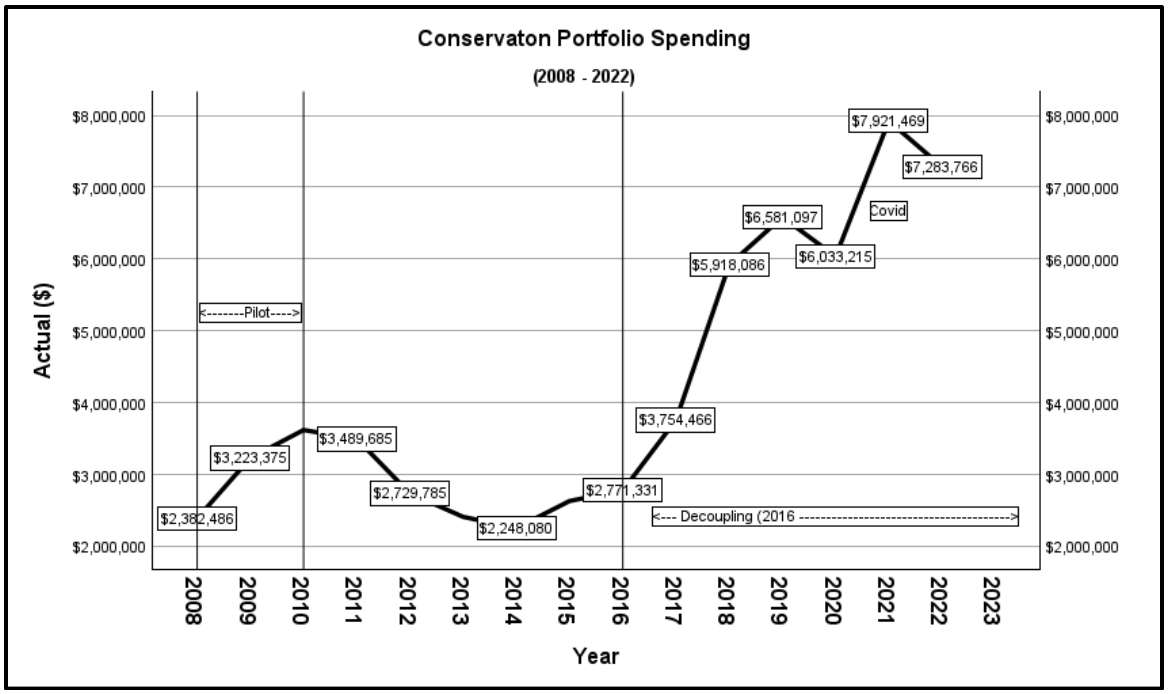

Figure 5-1: Overall Conservation Portfolio Spending by Year.

Conservation spending by year is disaggregated into commercial/industrial sector (Figure 5-2) and residential sector (Figure 5-3). As shown in these figures, both graphs show the same pattern of increase for conservation indicators as the overall conservation portfolio spending graph.[38]

Commercial/Industrial Conservation Spending

As shown by the shape of the graph in Figure 5-2, commercial/industrial conservation spending by year shows an upwards trend in the prior decoupling pilot (2008-2010) and during the current decoupling.[39]

[38] Overall spending includes conservation spending outside the residential and commercial programs, for example for regional conservation relationship efforts. Residential spending shown here does not include low-income programs. Commercial spending is commercial program spending.

[39] The 2008-2010 decoupling pilot overlapped with the Great Recession and the current decoupling overlaps the Covid recession (beginning February 2020) and the continuation of Covid.

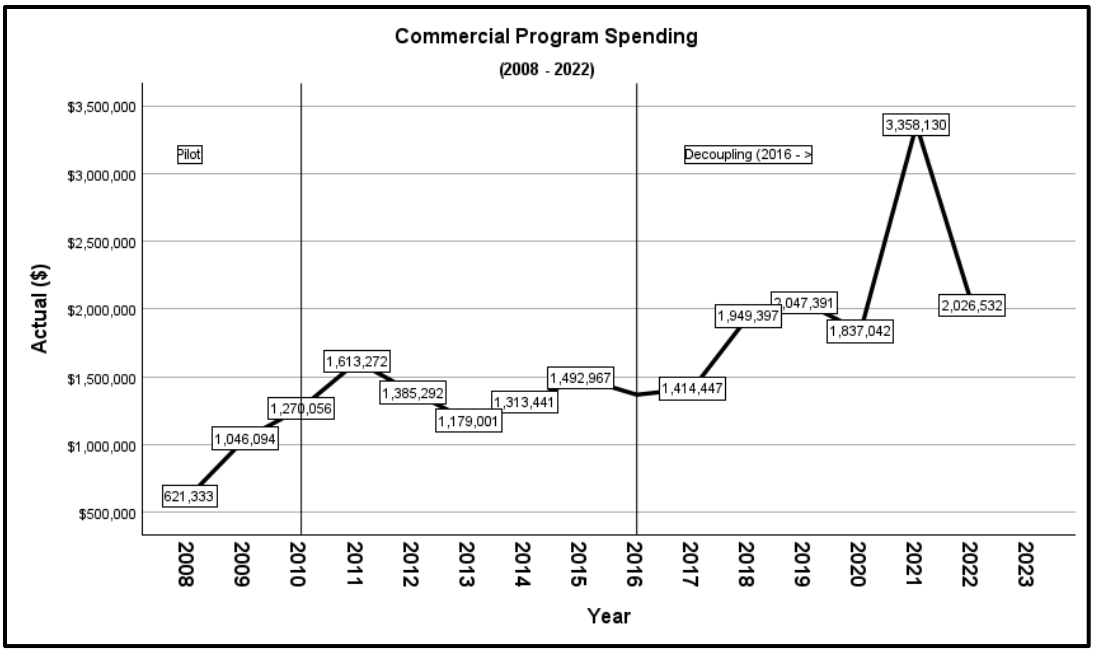

Figure 5-2: Commercial Conservation Spending by Year.

Residential Conservation Spending

As shown by the shape of the residential conservation spending curve (Figure 5-3), residential conservation spending by year trended upwards in the prior decoupling pilot (2008-2010) and, similarly, is trending upwards during the current decoupling.

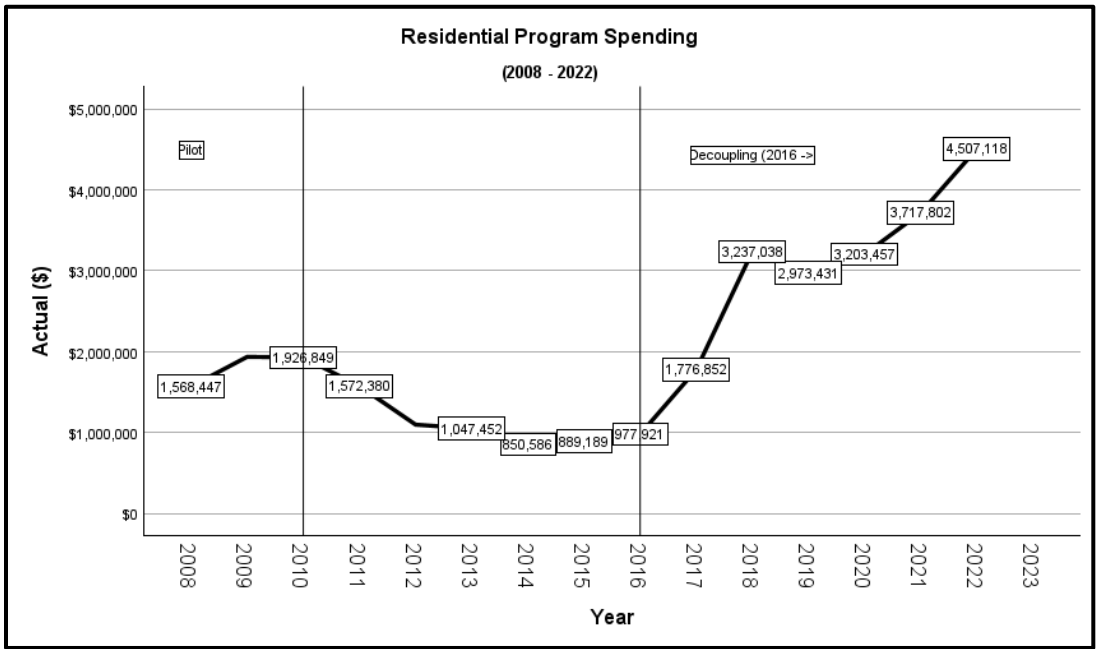

Figure 5-3: Residential Conservation Spending by Year.

C. Analysis of Conservation Achievement

At first glance the therms achieved by year for the overall portfolio does not suggest a stable pattern (Figure 5-4). However, disaggregated by sector, the instability is seen to be in the commercial performance (black dotted line in Figure 5-4) while the residential performance is regular and well-behaved (green curve in Figure 5-4). It is the "jaggedness" or "lumpiness" of the commercial curve that is reflected in the overall conservation portfolio curve.

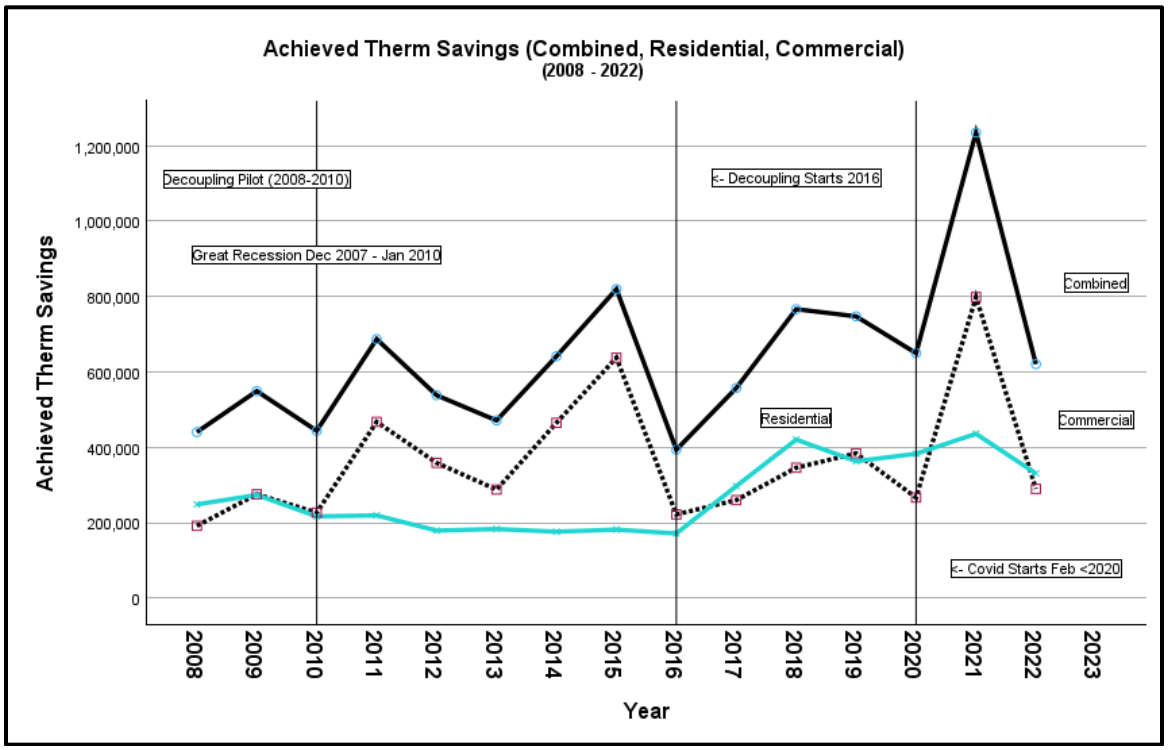

Figure 5-4: Achieved Therms by Year.

Pattern (Lumpy) & Trend (Upwards)

A "lumpy" commercial curve is typical for conservation programs; commercial curves are often irregular.[40] Though residential jobs show variation, commercial jobs include all kinds of commercial and industrial business in a wide range of sizes. In the commercial sector size is important in influencing the jaggedness of the curve since one or two large projects can shape a curve for a given year. Also, because commercial projects often stretch over more than one year to completion (jobs started in a year may be credited in the following year), variation from year to year tends to be high. Residential jobs tend to be more uniform, and do not normally take more than a few months to complete, so their

[40] Smoothing out commercial curves requires doing many more jobs per year or doing small bits of more buildings, but doing small bits is in tension with going after deep savings, so some "lumpiness" has to be accepted.

conservation achievement curves tend to be smooth in comparison with commercial conservation achievement curves.

For the purposes of this section, the question is whether or not conservation achievement trends upward in decoupling years. The answer is clearly, "yes." For the decoupling beginning in 2016, both the commercial and residential sectors show a strong upward trend in conservation achievement.

For context, the programs took a more strategic approach on the C/I side to how the vendor (TRC Companies), addressed the custom vs. prescriptive program offerings. They focused on the prescriptive uptake and increasing this more dependable therm savings bucket because the custom projects do have more variability and the program did not want to rely so heavily on these fluid projects. Although we can see the impact of Covid with a lag of about one year, both conservation spending and conservation achievement tend to increase and remain higher in decoupling years.[41]

Table 5-1: Therm Savings by Year.

Conservation Achievement by Year					
Year	Therm Savings				Regulatory Process
	Overall Portfolio	Commercial	Residential	Low-Income	
2008	454,480	191,837	248,658	13,985	Prior Decoupling Pilot (Dec 2007 - June 2010)
2009	564,170	275,604	273,833	14,733	
2010	474,825	227,017	216,999	30,809	
2011	711,383	467,657	219,596	24,130	Regular Rate Regulation
2012	560,157	359,003	179,330	21,824	
2013	486,391	288,079	183,352	14,960	
2014	648,953	465,176	176,439	7,338	
2015	831,501	637,930	181,847	11,724	
2016	405,557	222,194	171,620	11,743	Current Decoupling
2017	562,956	260,176	297,216	5,564	
2018	771,819	345,999	420,639	5,181	
2019	760,956	384,176	363,364	13,416	
2020	659,176	266,945	383,018	9,213	
2021	1,243,223	798,874	436,103	8,245	
2022	627,941	289,919	330,768	7,254	

[41] When Covid spread rapidly, utilities had to cut back and sometimes suspend field work. Covid also interfered with new program sign-ups, causing a drop in participation and results with a lag of about one year. Covid is an example of a case of external forces operating on energy conservation programs. Sometimes exogenous forces are, for a time, stronger influences on programs than the tractable variables under program control.

The percentage distribution of therms saved by year by program type is shown in Figure 5-5: Percentage Distribution of Therms Saved Each Year. The factor that shapes this chart is the "lumpiness" of the commercial sector. In any individual year, when a set of commercial sector jobs is completed, the commercial percentage may be high, followed by a lower percentage the next year (with fewer completions). From 2016 through 2022, and also from 2020 to 2022, the commercial sector has accounted for about 50% of therms, the residential sector 49%, and the low-income customers about 1% of therms saved.

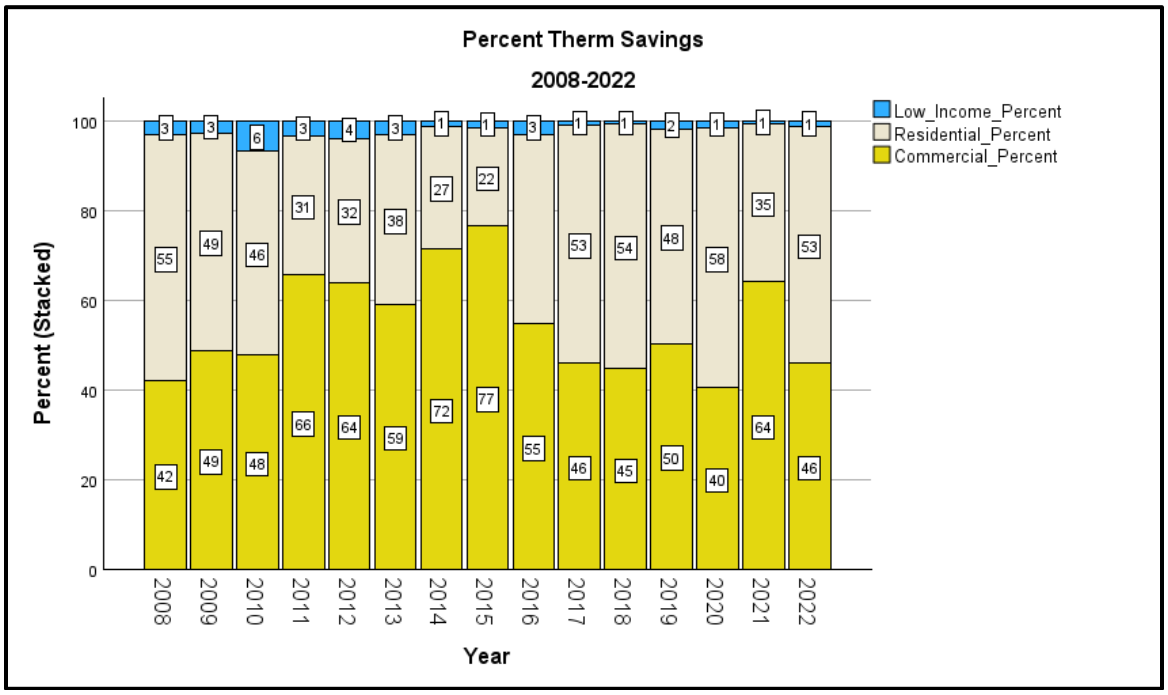

Figure 5-5: Percentage Distribution of Therms Saved Each Year.

D. Conservation Program Changes

Each year, Cascade files an Annual Conservation Achievement Report, providing information on goals and therm savings achievements. It also reports performance on the Total Resource Cost Test and the Utility Cost Test (Program Administrator's Cost Test), along with the long-term discount rate used for purposes of program reporting.

As to the "lumpy" nature of the commercial therms savings tied to the tendency for sizable commercial/industrial projects and groups of commercial projects to complete in a particular year, Cascade notes in the 2014 Conservation Achievement Report, "As holds true from past years, programmatic achievements in the Commercial and Industrial sectors are dependent upon a few critical deep therm-savings projects. It is also common for commercial and industrial projects to stretch beyond the program year in which they

were initiated.")[42] Also, in 2015, "…the 2015 program year yielded higher savings in the C&I sector than in 2014 with several major projects concluding." Working with the Conservation Advisory Group, Cascade moved to a "paid date" method for recording projects in 2015.

Incentive levels were studied in 2016, with the goal of encouraging more participation, and there was a focus on particular measures. In 2017, in response to recommendations from Commission Staff under Docket UG0161253, Cascade added a new reporting category, "Direct Benefit to Customer (DBtC)" ratio, with a target of 60 percent of expenses being attributed as a direct customer benefit. Also, Cascade contracted with Applied Energy Group (AEG) to perform a Conservation Potential Assessment Study, released in the second quarter of 2018. In 2018, Cascade additionally focused on increasing C/I prescriptive program participation which can contribute to some smoothing out of the C/I therms savings curve.

In 2018, Cascade notes work with NEEA to introduce alternative high-efficiency water heater measures to the portfolio as they mature, and work with trade allies to promote upstream rebates. In 2019, deemed savings per install were reduced on average by approximately fifteen percent, based on the last Conservation Potential Study performed by AEG.

On March 23, 2020, the Governor of Washington issued a "Stay Home, Stay Safe" proclamation, ordering, in part, that, due to Covid, people should stay home to the extent possible and only essential businesses should operate (Figure 5-6).[43]

> **To implement this mandate, I hereby order** that all people in Washington State are immediately prohibited from participating in public and private gatherings of any number of people for social, spiritual, and recreational purposes.

Figure 5-6: Portion of Governor's Order.

All energy utilities, including Cascade, accordingly, cut back fieldwork in energy conservation involving direct personal contact, emphasized essential projects (such as schools), and innovated to direct work to areas compatible with state direction. Cascade's response is summarized by WUTC staff in a letter for a meeting on July 29, 2021[44] (Figure 5-7).

[42] The "lumpiness" of C/I savings results as a dependence of C/I results on a few projects with deep savings was again noted in 2016, 2017 and 2018.
[43] https://governor.wa.gov/news/2020/inslee-announces-stay-home-stay-healthy-order.
[44] https://apiproxy.utc.wa.gov/cases/GetDocument?docID=21&year=2019&docketNumber=190957

Cascade Natural Gas (UG-190957)
Cascade reacted to the effects of the pandemic in a variety of ways. On the non-residential side, the company focused its custom project efforts on businesses deemed "essential" by the State, which allowed Cascade's construction contractors more access than they had to non-essential businesses. As a result, Cascade completed several customer projects at schools and other essential businesses. (Overall, however, customer project therm savings in 2020 were down nearly 80 percent from 2019.) Cascade also emphasized energy savings kits (ESKs; these include showerheads, faucet aerators, and, for the commercial/industrial sector, pre-rinse spray valves) for both residential and non-residential customers, expanding ESK savings from residential customers nearly four-fold. The Company increased its outreach to new home builders, resulting in a strong increase in new homes applications. Finally, the Company planned for new 2021 non-residential offerings, including a drawing for a free high-efficiency food fryer, a midstream tankless hot water heater offering, and a bonus for bundling several efficiency measures at once.

Figure 5-7: Summary of CNGC Covid Response.

Covid is an example of how exogenous factors can in certain periods of years exert more control on conservation achievement than the tractable variable open for management through utility programs are able to offset. However, Cascade and other energy utilities continue to work to improve results through adaptive management to changing economic and social constraints. Cascade continues to work with AEG on updating Conservation Potential and has chartered a series of program evaluations. Cascade also continues to work jointly with NEEA. Changes to Washington building codes will cut back opportunities for some energy efficiency measures, though, as Cascade has noted, may contribute over time to a more efficient overall housing stock. However, 2021 code changes originally scheduled for 2023 have been delayed until March of 2024.

Conservation authorized staffing for 2020 through 2023 has shown an increase. In 2020, there were eight full-time staff working on energy efficiency programs plus two temporary/part-time staff. Full-time staff increased by one in 2021 while temporary/part-time staff was reduced by one. In 2022, full-time staff was again increased by one, and the temporary/part-time position was maintained. Currently (2023) there are ten full-time staff positions and no temporary positions.[45]

E. Summary

Based on interviews, discussions, records, and responses to data requests (DRs), and participation in Conservation Advisory Group meetings over several years, we find that Cascade has established a record of excellence and of consistent good faith in fulfilling the overall conservation portfolio, including the commercial/industrial and residential components of conservation program achievement throughout the span of the decoupling

[45] See response to DR 20.

years to date, and the recent challenges of the Covid pandemic, which, of course, continues in new forms and accompanies flu and RSVs.

We observe that Cascade conservation work has been engaged with vigor and intelligence. *There is zero indication of any negative effect of decoupling on energy conservation effort. For both the commercial/industrial and residential sectors, conservation achievement has moved upwards in the decoupling years.*

In addition, our overall review of Cascade management of the conservation effort indicates that Cascade's conservation effort is mature, reflecting effective interrelationships with regional conservation direction and methods, understanding of ongoing technical and engaging consultants familiar with energy conservation practice at the regional and national levels. At the executive level, the company has strength in seasoned understanding of (and orientation to) adaptive management, and at the management and staff levels we see competence and good faith in implementing commission directives, regional protocols, and evolving practices that serve customers and meaningfully advance energy conservation.[46]

[46] We (HGPA) have observed ongoing conservation work by CNGC over several years and have attended over 20 Conservation Advisory Group meetings to follow conservation developments and progress.

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6. Analysis of Revenue Effects

In this section we examine the effects of the decoupling mechanisms on Cascade's revenue. The obective of Task 7, is shown below:

- *Determine if the Decoupling Mechanisms has had a stabilizing impact on Company revenues.*

Relating to this objective are the following evaluation questions:

- *What impact did the Decoupling Mechanisms have on the Company's revenues (i.e., has there been a stabilizing effect)?*
- *What are the results of the earnings test?*
- *How often has the rate cap limited the increase in RS 594 rates?*

Our discussion in this section is organized by each of the evaluation questions listed above. Much of the data used to address these questions has been presented in other sections of this report and is repeated here for ease of discussion and the convenience of the reader.

A. Has Decoupling Stabilized Revenue

The evaluation question addressed is:

> *"What impact did the Decoupling Mechanisms have on the Company's revenues (i.e., has there been a stabilizing effect)?"*

This is a straightforward question answered by comparing actual revenue with actual revenue plus deferred revenue. To answer this question over the current evaluation period, we calculated the annual variation in revenue over the years 2020 to 2022 with and without the revenue from decoupling deferrals. We used the coefficient of variation (COV), calculated as the standard deviation divided by the mean, as our measure of variability. Margin revenue with deferrals is shown in Table 6-1for each core customer class.[1]

Table 6-1: Margin Revenue with Decoupling (including DMA Deferrals).

	Residential (RS 503)	Commercial (RS 504)	Industrial (RS 505)	Large Volume (RS 511)	Interruptible (RS 570)	Total
	(Millions of dollars)					
2020	39.3	23.1	2.0	2.0	0.1	66.5
2021	42.6	24.9	2.1	2.2	0.1	71.9
2022	43.5	25.1	2.2	2.2	0.1	73.1
Mean	41.8	24.4	2.1	2.1	0.1	70.5
Std Dev	2.2	1.1	0.1	0.1	0.0	3.5
Coef. of Variation	5.3%	4.5%	4.6%	6.4%	7.3%	5.0%

The calculations for the COV, a measure of variability, are also shown in Table 6-1. Residential (RS 503), commercial (RS 504) and smaller industrial (RS 505) customers have shown the least variability in revenue under decoupling. Margin revenue variability for large volume (RS 511) and interruptible (RS 570) customers have been larger than other decoupled customer groups.

Margin revenue for the five core customer groups without decoupling is estimated by removing decoupling deferred revenue from the revenue with decoupling. These results are shown in Table 6-2.

Table 6-2: Margin Revenue without Decoupling.

	Residential (RS 503)	Commercial (RS 504)	Industrial (RS 505)	Large Volume (RS 511)	Interruptible (RS 570)	Total
	(Millions of dollars)					
2020	37.9	20.7	1.9	2.7	0.1	63.2
2021	40.3	23.5	1.9	2.1	0.1	67.8
2022	44.8	27.2	2.2	2.2	0.1	76.6
Mean	41.0	23.8	2.0	2.3	0.1	69.2
Std Dev	3.5	3.3	0.2	0.3	0.0	6.8
Coef. of Variation	8.6%	13.8%	9.3%	13.2%	5.7%	9.9%

As can be seen by comparing the percentage variation with decoupling (last row of Table 6-1) to the percentage variation without decoupling (last row of Table 6-2), revenue variability is lower with decoupling. This comparison is shown graphically in Table 6-1 by customer classes and total core revenue.

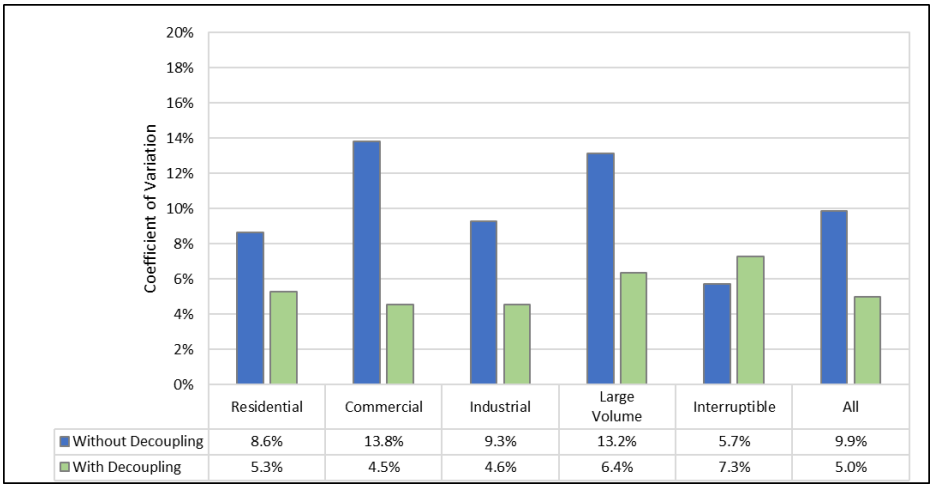

Figure 6-1: Revenue Variability with and without Decoupling (2020-2022).

It is clear from the results shown in Figure 6-1 that decoupling has had a stabilizing effect on revenue, lowering revenue variation in every customer class with the exception of

interruptible customers. Across all customer classes, decoupling has reduced variation in margin revenue by about half.

The percentage drop-in variability from decoupling, measured as the difference in COV with and without decoupling divided by the COV without decoupling, is shown in Figure 6-2.

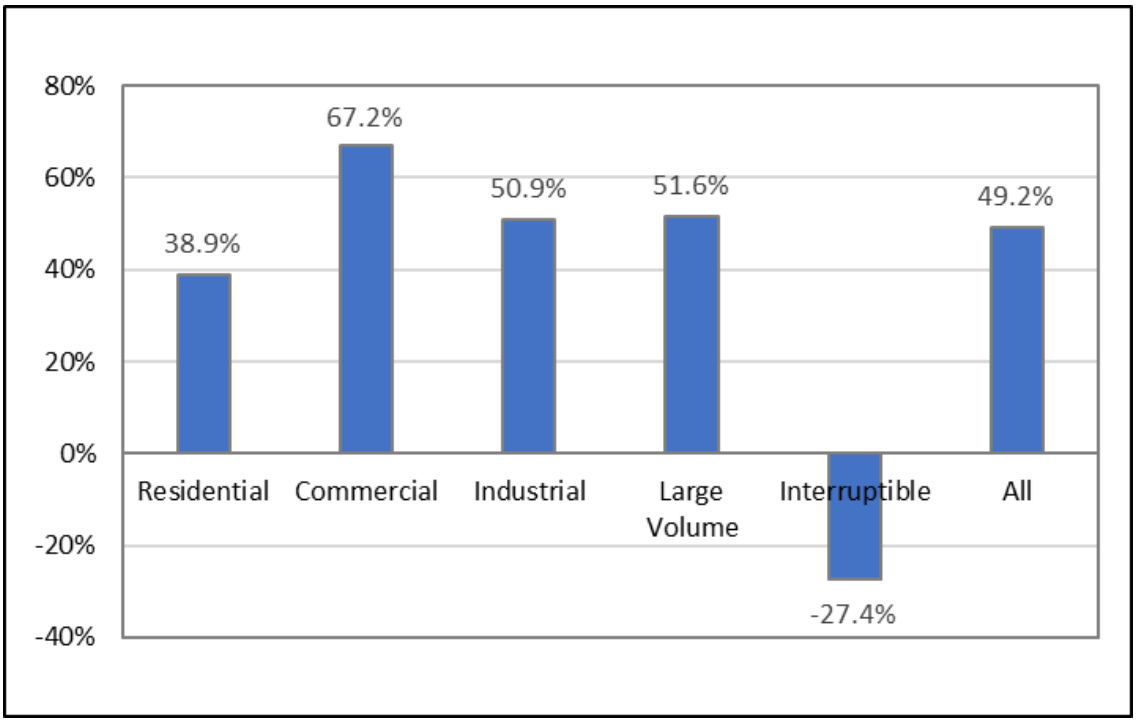

Figure 6-2: Percent Reduction in Margin Revenue Variability with Decoupling (2020-2022).

Substantial reduction in the variability of margin revenue due to decoupling is evident in all customer classes except for interruptible customers. Overall, margin revenue variability over the 2020-2022 period considered in this evaluation was half of what it would have been without decoupling.

B. Review of Earnings Test and Rate Cap

Decoupling can also have revenue effects stemming from the earnings test and Three Percent Cap on rate changes due to decoupling, both provisions of Cascade's DMA. The evaluation questions addressed are:

What were the results of the earnings test?
How often has the rate cap limited the increase in RS 594 rates?

Excess earnings are defined as earnings over the allowed rate of return. The earnings test is calculated to determine if there are excess earnings and if so, the amount of excess earnings. If excess earnings exist, Cascade shares 50 percent of the excess earnings with

decoupled customer classes. As explained in Section 1, the earnings test is calculated before the rate cap so that customer surcharges due to decoupling are reduced by the amount of shared excess earnings. Customer credits due to decoupling are increased by excess earnings.

The decoupling settlement stipulates that the change in the decoupling rate cannot add more than three percent to expected revenue before the change. If necessary, decoupling rates are capped to a level that limits the expected change in revenue to 3 percent and the amount of revenue that was not allowed to be amortized in the new decoupling rate is carried forward. Table 6-3 shows the annual history of both the earnings test and the rate cap.

Table 6-3: Summary of Excess Earnings Test and Three Percent Rate Cap.

RS 594 Effective Nov 1st	Excess Earnings	Did the 3% Cap Come into Effect to Limit RS 594 Rates				
		Residential (RS 503)	Commercial (RS 504)	Industrial (RS 505)	Large Volume (RS 511)	Interruptible (RS 570)
2021	$0	No	Yes	No	No	No
2022	$0	No	Yes	No	Yes	No
2023	$0	No	No	No	Yes	No

Each row in Table 6-3 shows the results of the earnings test and the three percent cap that impacted the decoupling mechanism adjustment rate (RS 594) that became effective on November 1st of the year shown. The RS 594 rates that go into effect on November 1st of any given year are largely determined by deferral balances from the prior calendar year. Hence the rate that went into effect on November 1, 2021 (first row in Table 6-3) reflects deferral balances from 2020. As shown in the table, for the Residential Rate (503), the application of the excess earnings test has shown zero excess earnings for every period in this evaluation[2]. The table also shows that the three percent cap on annual rate increases from the decoupling rate has limited RS 594 rates for commercial customers (RS 504) and large volume customers (RS 511) in two rate years for each of these customer groups. The other customer groups were not impacted by the three percent cap over the evaluation period.

C. Summary – Analysis of Revenue Effects

Cascade's decoupling mechanism has had a stabilizing effect on revenue, reducing variability. of margin revenue over the 2020-2022 period in all customer groups except interruptible customers. Interruptible customers had the least amount of margin revenue variability without decoupling and showed a slight increase with decoupling. Overall Cascade margin revenue variability has been reduced by nearly 50 percent from decoupling.

The excess earnings test has shown that earnings have not exceeded the authorized ROR, resulting in zero excess earnings in each period considered in this evaluation. For

decoupling rates (RS 594) effective November 1st of each rate year from 2021-2023, the three percent cap on annual rate increases from the decoupling rate has limited RS 594 rates for commercial customers (RS 504) and large volume customers (RS 511) in two rate years for each of these customer groups (2021 and 2022 for RS 504 and 2022 and 2023 for RS 511). Other customer groups were not impacted by the 3 percent cap over the evaluation period.

Because the earnings test did not come into play, it is not possible to see how certain features of the DMA were applied operationally. For example, (1) when excess earnings are present, how is the 50 percent that is shared back to the customer split between the customer classes? Also (2), regarding the three percent cap on rate changes due to decoupling, should the cap be calculated at the customer class level or for all customer classes combined?

Recommendation: We recommend continuation of Cascade's current practice - the three percent cap, when applicable, should continue to be applied at the level of each customer class. In our assessment, an objective of a rate cap is to limit rate shocks due to decoupling. CNGC is using this approach, and it is useful in controlling the size of rate decoupling rate changes.

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7. Analysis of Possible Adverse Factors

Throughout the study, we found no evidence of adverse impacts on customer service, price signals, or utility program operations as a result of the decoupling mechanisms.

A. Service Quality

As shown in Table 7-1 and Table 7-2, there is no indication of any decrease in service quality between the two years prior to decoupling (2014 and 2015) and for seven decoupling years (2016 through 2022) for which data is available.[47] Service quality is high, and constant.[48]

For table 7-1, there is variation in the number of customer complaints received, but if considered in relation to number of customers, the variation is very small so that these results represent consistently high service quality.

Table 7-1: Service Quality – Complaints, Response, Missed Appointments.

Annual Service Quality Reports						
Year	Number of Customer Complaints		Call Received to Order Placed	Field Response Time	Total Time	Missed Customer Appointments
	Received	Filed				
2014	93	18	3 min 7 sec	33 min 8 sec	36 min 15 sec	0
2015	138	11	4 min 11sec	36 min 0 sec	50 min 11 sec	0
2016	155	5	3 min 11 sec	38 min 0 sec	41 min 11 sec	0
2017	269	7	3 min 49 sec	40 min 53 sec	44 min 42 sec	0
2018	267	8	3 min 33 sec	37 min 45 sec	41 min 18 sec	0
2019	323	3	6 min 43 sec	36 min 25 sec	43 min 8 sec	2
2020	175	7	4 min 50 sec	26 min 23 sec	31 min 13 sec	0
2021	132	6	8 min 9 sec	38 min 4 sec	46 min 13 sec	0
2022	173	3	4 min 10 sec	32 min 40 sec	36 min 50 sec	1

In table 7.2, the percentage of disconnects due to nonpayment begins at 2.65% and ends at 0.71%, but the lower percentages from 2020 to 2022 are likely due to the Covid epidemic and measures taken to control the epidemic and to provide additional support to customers experiencing payment problems. The pattern indicates that these programs did improve the economic resources of customers Covid, but, overall, service quality is high. The drop in response times for calls is noticeable, perhaps indicating lower staffing or a difference in the

[47] Service quality data provided by Avista in response to DR 17; copies of yearly CNGC Customer Service Quality Report.

[48] At a more micro level, we can see that number of complaints dropped during Covid, percent disconnects due to non-payment went down noticeably, and the number of calls declined during 2020 and 2021, while it took longer to answer calls. These are likely effects associated with the Covid era and fit with our (HGPA) experience with other utilities, both IOUs and government-related, and with state services in the utility area. Covid temporarily increased supports for utility customers, resulting in fewer economic problems, and has had an effect on work patterns. These changes, positive and negative, are noticeable but quite small, and are likely not associated with decoupling.

ways customer contact is organized or approached but are probably not atypical for customer response by consumer services across industries since Covid.[49]

Table 7-2: Service Quality – Percent Disconnects, Calls, Time to Answer.

Annual Service Quality Reports						
Year	Percent Disconnects due to Nonpayment		Number of Calls	Percent Calls Answered Live w/in		
	Residential	Commercial		Sixty Seconds	Fifty Seconds	Forty Seconds
2014	2.65%	1.44%	294,562	81.41%	79.33%	76.86%
2015	1.70%	1.10%	263,518	80.22%	77.96%	77.28%
2016	1.96%	1.27%	276,725	86.63%	85.29%	83.71%
2017	1.98%	1.29%	274,452	89.90%	88.78%	87.40%
2018	1.85%	1.20%	295,602	75.34%	74.02%	72.61%
2019	1.55%	1.37%	236,334	78.98%	77.54%	75.97%
2020	0.14%	0.11%	257,335	63.89%	62.51%	61.07%
2021	0.09%	0.14%	216,797	58.89%	52.49%	50.49%
2022	0.71%	0.66%	279,292	52.54%	42.99%	41.48%

B. Observations

We have attended several Cascade Conservation Advisory Group (CAG) meetings and can note that discussion in these (usually all morning) meetings is functional and productive, and the meetings are well run. There is no indication of other than substantial and continuing good faith effort in designing and delivering services and in continually working to improve and adjust practice to changing conditions.

C. Summary – Possible Adverse Factors

We found no evidence of adverse impacts on customer service, price signals, or utility program operations as a result of the decoupling mechanisms. There is no indication of any meaningful decrease in service quality.

[49] It is not clear that a difference in 80% to 50% answer time in sixty seconds is a useful indicator. If answer time drops to two minutes or three minutes, that could be a more useful indicator.

8. Appendix – Adjusting for Weather

A primary purpose of a decoupling mechanism is to provide ongoing revenue recovery sufficient to meet the costs of utility operation. In principle, this required amount is the same, whether developed in the context of a standard rate case or in the context of decoupling. For Cascade, decoupling recovery is limited to certain fixed costs which are recovered through the variable (per unit energy) portion of customer bills.

Weather has a meaningful effect on energy sales. For natural gas, we focus on Heating Degree Days.[50] Decoupling mechanisms are typically set up based on the concept of "normal weather".[51] In standard practice, the difference between the actual therm and the calculated "normal weather" therm use can be used to explain the decoupling adjustment to rates (the margin, plus or minus, embodied in the decoupling adjustment).

However, though in standard analysis for decoupling studies, the calculation of therm usage under the calculated projection of "normal weather" the decoupling mechanism does not require the use of a weather calculation. The concept of "normal weather" is continuing to lose meaning since planetary physics is changing, such that day by day and year by year heat, retained heat energy is increasing. In this context, it is useful to modify the method used to calculate "normal weather" and it may be useful to discard the "normal weather" concept entirely. That is, it may be useful to drop the weather calculation component from decoupling implementation and analysis, and simply proceed with the fixed cost dollar amount set in the decoupling plan and ensure revenue recovery without reference to a "normal weather" calculation.

However, we are in the middle of a shift of paradigms, and we can, as an intermediate step, keep the concept of "normal weather" but drop the number of years in the calculation to improve accuracy of estimates. We certainly to drop the use of TMY data and, instead, use more current yearly HDD weather station data in regression analysis. Most utilities use a 30-year average as calculated by the National Oceanographic and Atmospheric Administration (NOAA), which makes US Typical Meteorological Year (TMY) Climate Normals available through the National Centers for Environmental Information (NCEI).[52]

[50] An electric utility might focus on both HDD and CDD. A water utility might focus primarily on CDD.
[51] Due to climate change, "normal weather" is a concept that is losing meaning. As the HDD weather trend has become increasingly important, projection of normal weather based on a 30-year TMY or (better) on a 30-year regression analysis using weather station data, increasingly projects abnormal weather. (Weather as if there were not HDD trend.) Since the planet is out of balance with regard to cumulative absorption of heat energy, it makes little sense to model based on the weather patterns of the previous more stable period. Instead, we need to begin to model expected weather rather than "normal weather." We need to replace the previous "normal weather" paradigm by a paradigm that more accurately fits evolving climate conditions. We start here using 30-year "normal weather" because decoupling, as a standard method, has be implemented using the "normal weather" concept. In this section, we suggest how to begin to modify the weather calculations. However, decoupling does not require a weather calculation, so a reasonable alternative would be to drop "normal weather" calculations from decoupling studies.
[52] In order to be consistent with CNGC, normal weather for this analysis is defined as the 30-year average calculated by NOAA for the 1981 through 2010 period (1981-2010 U.S. Climate Normals). NOAA updates their estimates of Climate Normals every decade.

As an example, actual and normal heating degree days are shown for each of the three full calendar years covered in the previous study are shown in Table A-8-1.[53]

Table A-8-1: Comparison of Actual and Normal Annual Heating Degree Days

	Heating Degree Days		
	2017	**2018**	**2019**
Actual	3,938	3,369	3,884
Normal	3,939	3,939	3,939
Percent Difference	0.0%	-14.5%	-1.4%

Holding everything else constant and considering just the variances from normal degree days shown in Table A-8-1, it would be reasonable to expect deferral balances for weather sensitive customer classes to be small in 2017 and 2019 but strongly positive in 2018. As expected from the weather pattern, positive deferral balances were observed for residential and commercial customers in 2018. Residential and commercial customers are the two most weather sensitive customer classes. While many factors influence customer usage including energy efficiency investments, nearly 15 percent warmer than normal weather in 2018 contributed to the decoupling surcharge that became effective in customer rates November 1, 2019.

Figure A-8-1 shows the difference between actual and normal HDD from the beginning of decoupling deferral-balance tracking (August 2016) through August 2020. A negative value means warmer-than-normal weather (*i.e.*, less than normal need for space heating).

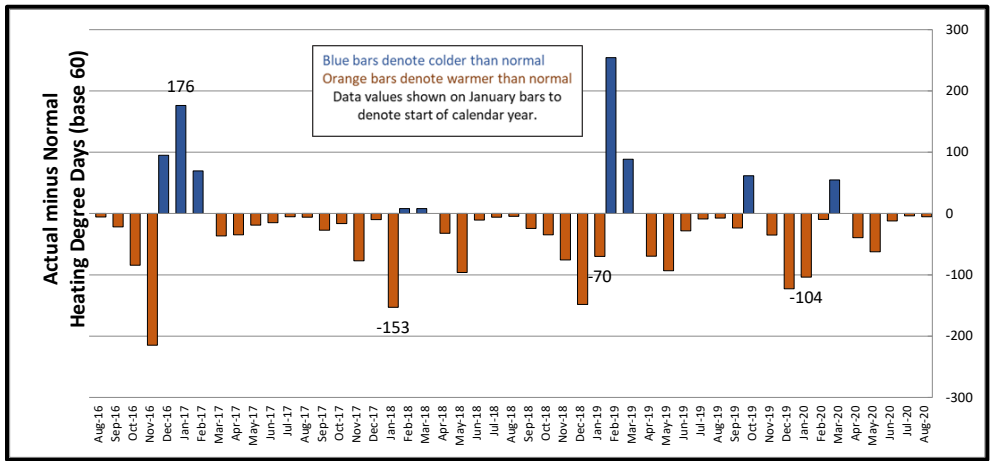

Figure A-8-1: Monthly Heating Degree Days (difference from normal)

The pattern in Figure A-8-1 shows that since the inception of decoupling deferral-balance tracking there have been more months with warmer-than-normal weather than there have been

[53] Actual and normal HDD are calculated from NOAA records for the four weather stations CNGC uses for the state of Washington: Bellingham (0.41), Bremerton (0.21), Walla Walla (0.19), and Yakima (0.19). Weights provided by CNGC to weight each station to the total for Washington are shown in parentheses. Beginning in 2019 CNGC replaced the Hoquiam weather station with the Bremerton weather station for daily temperature records.

months with colder-than-normal weather. The monthly pattern also shows colder-than-normal months mostly occurred in early 2017 and early 2019. Calendar 2018 was either near normal or warmer than normal in every month, resulting in fifteen percent lower HDD than normal (see Table A-8-1).

A. Annual Long-Term HDD Patterns

Because expectations regarding weather are important in utility planning and ratemaking, it is useful to consider how weather patterns have been changing over time. Normal weather refers to the weather expected over a typical meteorological period. NOAA calculates and publishes normal weather for thousands of weather stations using a 30-year period of history. The 30-year period used is shifted forward once every decade with the most recent NOAA 30-Year weather normal period being 1981 through 2010. Cascade uses NOAA's most recent 30-Year normal weather for planning purposes.

A comparison of the difference between actual and normal HDD over the last 60 years is shown in Figure A-8-2 for the weather stations in Washington used by Cascade.[54]

Blue bars in the graph denote colder-than-normal years (actual HDD exceeds normal HDD) and orange bars denote years with warmer-than-normal weather. A visual inspection of this figure appears to indicate that somewhere around 1990 the frequency of warmer-than-normal years (orange bars) started to exceed the frequency of colder-than-normal years (blue bars).

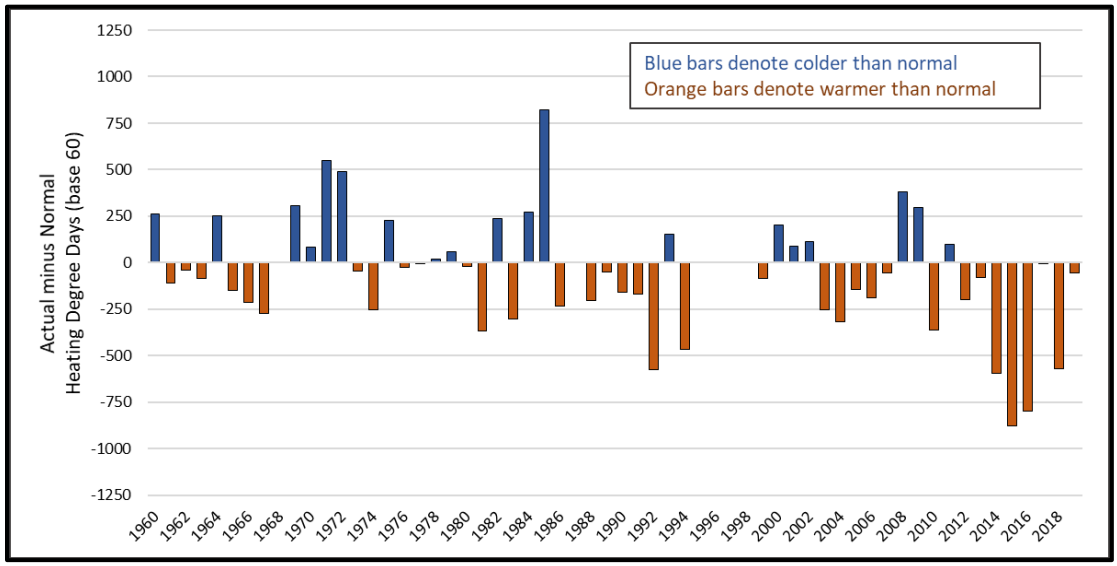

Figure A-8-2: HDD Variation from Normal, WA CNGC Weather Stations (1960-2018).

[54] Because of gaps in reporting from one or more weather stations the following years were removed from analysis: 1987, 1995, 1996, 1997, and 1998.

Another pattern in the figure is that, with a few exceptions, the magnitude of the blue bars appears to become smaller over time and the magnitude of the orange bars appears to be getting larger over time. In other words, a trend toward warmer weather is evident. Closer examination of the question of trending HDD is shown in Figure A-8-3.

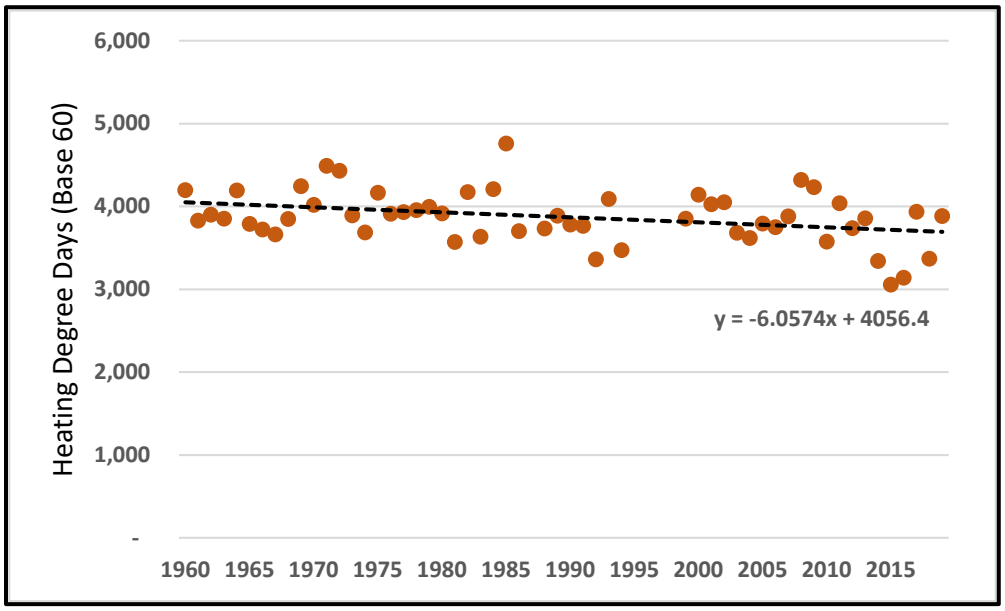

Figure A-8-3: HDD History and Trendline, WA CNGC Weather Stations (1960-2019).

Annual actual HDD since 1960 are plotted in the figure along with a trendline (dashed line) to quantify the magnitude of the trend term ("x" in the equation shown on the chart). As with the prior figure, five years with missing data for one or more weather stations have been removed from the analysis and estimation of the trendline. Visually, there is a slight downward trend in HDD over time. By fitting a simple trendline to the data we are able to quantify the magnitude of the trend in HDD and determine if it is statistically significant.

The coefficient of the "x" term (-6.06) means that over the period 1960 through 2019, actual HDD has trended lower by 6.06 HDD with each passing year. The estimated trend toward lower HDD over time is statistically significant.[55]

These findings have implications for the use of NOAA 30-year weather normals. For one, since NOAA 30-year normals are updated every decade, our estimate of trend suggests that by the end of 10 years annual HDD have trended lower by approximately 61 HDD. An implication of the presence of trend in historical HDD is that a shorter period of time is preferable to a longer period of history so that the average over the entire period is more representative of what can be expected going forward. Another way to see this point is that an annual trend of negative 6.06

[55] The trend coefficient is statistically significant at the 0.01 level of probability. This means there is only a one percent chance of estimating this level of trend (-6.06) or higher if there were no trend.

HDD suggests that annual HDD are about 91 HDD lower at the end of the 30-year period than they were at the middle of the 30-year period (15 years x -6.06 HDD/year = -91 HDD). Since it has currently been nearly 10 years since the last NOAA update, we can expect that current estimates of HDD to include both sources of differences from trend and are therefore about 152 HDD too high (61+91).[56] This means that the standard calculation of normal weather using 30-year TMY, or 30-year regression analysis produces estimates that primarily compensate for climate change. Standard practice weather adjustment associated with decoupling reflects the strength of climate change, rather than other factors, such as energy conservation and energy efficiency improvements.

B. Summary and Recommendations – Weather Compared to Normal

Weather has been trending warmer in recent years such that when released, NOAA's weather normals for 1991-2020 are likely to reflect significantly warmer weather than the currently available 30-year normals based on 1981-2010 data. In order to deal with the impact of trending HDD we suggest CNGC consider the following modifications to weather calculations.

- Use a shorter period than 30 years to define climate normals. The use of 30 years by NOAA was decided nearly 100 years ago and is recognized as having shortcomings in today's environment.[57] While it is important to include several years for smoothing irregularities and estimating central tendency in the data, a shorter period will reduce the bias associated with errors due to trending temperatures over the estimation period. We suggest using 20 or 15 years to strike a balance between the need for several years over which to average data and the desire to minimize forecast bias due to trend.[58] While NOAA now publishes 5-, 10-, 15-, and 20-year normals, all periods currently end with 2010.[59]

[56] Another way to see this is an annual trend of -6.06 HDD applied to the distance between the middle and end of the 30-year period (15 years) plus the 10-year lag in NOAA updates since the 1981-2010 normals for a total of 25 years and an overestimate of 152 HDD due to trending weather (-6.06 x 25 years).

[57] See "https://www.ncdc.noaa.gov/news/defining-climate-normals-new-ways" for history and discussion on this topic.

[58] Betts, et al, propose 20 years, with the first ten years actual weather station data and the second ten years, statistical projection for future years for a different but related problem, determining the year we enter 1.5 degrees Celsius global warming. This approach does not make use of the concept of "normal weather" but moves to calculation of expected weather in specific future years. Drury and Gattie-Garza, for the different but related problem of estimation of changing energy savings potentials of conservation measures due to Climate Change (generally savings from cooling measures increase, while savings from heating measures decrease), similarly advocate the use of "as close to real-time data as possible." This approach also discards the concept of "normal weather."

[59] If the "normal weather" concept and calculation is retained, the problem in including less than fifteen years in the calculation is that the El Nino Southern Oscillation (ENSO) is variable. A cyclical-irregular, ENSO has three components: El Nino, La Nina, and a neutral segment in between, which occur in repeating sequence. The length and intensity of each component varies, so it is better to keep the number of years in the calculation at fifteen or more. This consideration would not apply if the problem were to be switched to estimation of weather in a particular year, as in the methods of Betts, et al, and Drury and Gattie-Gaza (see footnote 59).

- Do not use TMY data, use actual data from weather stations in regression analysis. Use a rolling annual update of normal weather to minimize bias due to the lag between the estimation period and the forecast period. For example, 20-year rolling normal weather would be updated annually using weather from 2000-2019, 2001-2020, 2002-2021, etc. Such updates would take place soon after the end of the 20-year period and are not available from NOAA.

- Consider the alternative approach of dropping the concept of "normal weather," and instead move to projection of expected weather, using no more than 20 years of data, and operationalize the HDD trend in the estimate.

- Consider dropping the weather calculation entirely since the decoupling mechanism can operate well without the weather component. Standard analysis supporting decoupling includes weather-normalized usage during a test year. Test year usage is then used along with other determinants to establish allowed revenue per customer. Differences between allowed and actual revenue per customer are then accumulated over a decoupling period and a new decoupling rate is established to ensure allowed revenue per customer is achieved, no more and no less. In other words, the utility's total allowed revenue from the last rate case is achieved regardless of test year assumptions about weather and usage. Given the bias associated with typical definitions of normal weather, Cascade should consider setting test year usage in a way that does not rely on biased estimates of normal weather. Examples include simple averages of usage over recent years and trend-based predictions of weather over the forecast period. Standard analysis supporting decoupling includes weather calculation, but this calculation is not essential.

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10. Recommendations

(1) Continue current calculation of Three Percent Cap: We recommend that the three percent cap, when applicable, continue to be applied at the level of each customer class. In our assessment, an objective of a rate cap is to limit rate shocks due to decoupling. CNGC is using this approach, and it is useful in controlling the size of rate decoupling rate changes.

(2) Joint Utility Walkaway Study: Consider initiating work towards a joint utility statewide systematic assessment of low-income weatherization walkaways. In federal/state Weatherization Assistance, walkaways are usually due to the need for a substantial amount of home repairs that must be completed before weatherization measures can be usefully installed. Sometimes, substantial health and safety improvements are required. Or it can be both. A walkaway is a devastating thing for a low-income household, and it can mean that a low-income household is unhoused, for example, when the furnace is red tagged or there are holes in the building shell.

(3) Weatherization Funding Rationales: If low-income housing is to be meaningfully addressed, there will need to be a continuing and programmatic commitment to meet needs as cost per weatherization job increases, as is the current situation. This is particularly necessary if equity and inclusion goals are increasingly implemented on a practical basis to achieve actual results. As with the current workarounds that permit some of these jobs to be completed, benefit is not captured in standard cost-benefit analysis but requires additional funding outside the assumptions of standard benefit-cost analysis. It is likely that decisions to proceed need to be policy-based using climate change disaster preparedness criteria, building sciences criteria, and health criteria, rather than simply by a standard cost-benefit criterion that devalues the future.

(4) Housing as a Utility: Since the federal government moved out of building low-income housing years ago, closing the housing production programs initiated during the Great Depression and turning housing over to the private sector, the failure to produce low-income and moderate-income housing has developed into severe crisis conditions. The inability of households to find or afford housing (either by purchase or through rental arrangements) has become an intolerable social problem in the US. Cascade might consider jointly exploring the production and operation and administration of affordable housing, tailored to resilience for the era of climate change, with its non-profit community-based partners and other non-profit housing groups.

In the 1930's, Catherine Bauer, a leader of the worker housing movement from the 1920's through the Great Depression, promoted the concept of *housing as a public*

utility.[60] Bauer was a drafter of the US Housing Act of 1937. Bauer's work contributed to the shaping of social housing worldwide, and especially in the US. She could not get housing as a utility into the Housing Act, but as a visionary, understood the Housing Act of 1937 as a step along the way, to be followed by additional major legislation that would crystallize the "housing as a public utility" concept. Tom Bender, the Oregon internationally recognized engineering economist leading "factor ten" economics has developed an approach to new housing designed to radically shrink financing costs and energy costs.[61] In Sweden, many households are in public housing, which is some of the best housing and best located housing and provides one example of a successful implementation of the housing as a public utility concept.[62] These could be explored on a cooperative basis.

(5) Calculation for "Normal Weather": Use a shorter period than 30 years to define climate normals. The use of 30 years by NOAA was decided nearly 100 years ago and is recognized as having shortcomings in today's environment.[63] While it is important to include several years for smoothing irregularities and estimating central tendency in the data, a shorter period will reduce the bias associated with errors due to trending temperatures over the estimation period. We suggest using 20 or 15 years to strike a balance between the need for several years over which to average data and the desire to minimize forecast bias due to trend.

(6) Do not use 30-year TMY data: Use regression analysis of weather station data rather than TMY data. A rolling annual regression analysis based on the most recent twenty years will minimize bias due to the lag between the estimation period and the forecast period.

(7) Consider dropping the Weather Calculation: Standard analysis supporting decoupling includes weather normalized usage during a test year. Test year usage is then used along with other determinants to establish allowed revenue per customer. Differences between allowed and actual revenue per customer are then accumulated over a decoupling period and a new decoupling rate is established to ensure allowed revenue per customer is achieved, no more and no less. In other words, the utility's total allowed revenue from the last rate case is achieved regardless of test year assumptions about weather and usage. Given the bias associated with typical definitions of normal weather, Cascade should consider setting test year usage in a way that does not rely on biased estimates of normal weather. Examples include simple averages of usage over recent years and trend based

[60] Bauer, Catherine, *Modern Housing*. Minneapolis & London, University of Minnesota Press, 1934; 2020 edition with forward by Barbara Penner.
[61] Bender, Tom, Learning to Count what Really Counts, The Economics of Wholeness. Manzanita, Oregon, Fire River Press, 2002.
[62] Rents are based on type of apartment, but not on location. Rather than rationing access on price, prime locations have longer waiting lists and turn over more slowly.
[63] See "https://www.ncdc.noaa.gov/news/defining-climate-normals-new-ways" for history and discussion on this topic.

predictions of weather over the forecast period. Standard analysis supporting decoupling includes weather calculation, but this calculation is not essential.

(8) Consider dropping Rate Groups with a handful of customers from Decoupling: Initially, calculations tended to be performed at the individual rate level. There is nothing wrong, in the abstract, in calculations by rate schedule or by consolidated rate schedules. However, because customers (particularly some groups of commercial customers) may move among the rate schedules over the decoupling years it is possible for a rate schedule with only a few customers, one of them large, to experience large changes in the decoupling adjustment due to movement of customers among schedules. CNGC has been aware of this problem and has largely fixed the problem by moving to consolidated rate groups. Generally, the more customers in a decoupling rate classification, and the more similar the customers are to each other in energy use, the less the potential problem. Conversely, the fewer customers in a decoupling rate group and the more dissimilar they are in patterns of energy use, the more there is a potential for large than anticipated rate effects. This is a potential problem that occurs with decoupling but not in the absence of decoupling.

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Cascade Natural Gas Decoupling Evaluation

H. Gil Peach & Associates, LLC

16232 NW Oakhills Drive

Beaverton, Oregon 97006

(503) 645-0716

hgp@adapt.global

www.peachandassociates.net