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June 29, 2018

Public Utility Commission of Oregon  
P.O. Box 1088  
Salem, Oregon 97308-1088

Attn: Filing Center

**RE: RG 49(3), OAR 860-085-0050(5) Greenhouse Gas (GHG) Compliance Report**

Cascade Natural Gas (Company or Cascade), submits this report in compliance with OAR 860-085-0050(5), which requires natural gas utilities to present the analysis it used to estimate the cost of reducing greenhouse gas (GHG) emissions from the Company's Oregon operations in the year 2020 to ten percent below 1990 levels and fifteen percent below 2005 emissions levels. This information will inform the Public Utility Commission of Oregon's (Commission's) report to the legislature, required per OAR 860-085-0050(7), that will include the estimated rate impacts for compliance to these greenhouse gas emission reduction targets.

The Company began by establishing the GHG emission goals of ten percent below 1990 levels and fifteen percent below 2005 emissions levels. The Company identified three sources of carbon emissions in its Oregon operations: natural gas usage for heating at office facilities, the use of company vehicles, and fugitive emissions from distribution operations within Oregon. Since Cascade does not have the historical data necessary to determine its 1990 or 2005 GHG emissions, 2011 emissions are used as a proxy for both years. Cascade is not able to claim this is an accurate proxy, but it is the best available benchmark the Company has for all three sources of carbon emissions.

Table 1 below establishes the two emissions reduction goals. The emissions by type are presented and then the ten percent and fifteen percent deductions for 1990 and 2005 are applied, respectively.

**Table 1 - 1990 and 2005 GHG Emissions Targets**

<b>Emissions in Metric Tons (MT)</b>	<b>1990</b>	<b>2005</b>
Office Facilities & Vehicles	703	703
Fugitive Emissions	7,094	7,094
<b>TOTAL</b>	<b>7,797</b>	<b>7,797</b>
<b>10% deduction</b>	(780)	
<b>15 % deduction</b>		(1,170)
<b>GOAL</b>	<b>7,017</b>	<b>6,627</b>

The Company determined its office facilities emissions by converting the annual natural gas therm usage to metric tons of emissions using EPA’s Subpart NN Equation NN-1:  $CO_2 = .001 \times \text{Fuel (Mscf)} \times \text{HHV (MMBtu/Mscf)} \times \text{Emission Factor (53.06 kg CO}_2\text{/MMBtu)}$ . Emissions for the use of vehicles were determined using an Environmental Protection Agency (EPA) Carbon Footprint Calculator<sup>1</sup> that takes into account miles driven and average fuel efficiency, and converts that into pounds of CO<sub>2</sub> emitted. From there, it is a simple conversion from pounds of CO<sub>2</sub>, to metric tons (MT) of CO<sub>2</sub>. Finally, fugitive emissions are estimated using the EPA’s methodology as established for their greenhouse gas reporting requirement in 40 CFR Part 98 Subpart W.

The Company’s 2016 report included estimates of fugitive emissions for the first time. In reviewing the calculations that were used to determine the proxy emissions for 1990 and 2005, and the 2015 fugitive emissions, the Company became aware of an error in the calculation. Rather than using the number of distribution services by type, the Company was using the miles of services by type, which was a pretty common area of confusion for natural gas distribution companies reporting to EPA for Subpart W. The company has made the corrections to the 2011 calculations and updated the 1990 and 2005 fugitive emissions estimates accordingly.

The Company notes that each methodology for measuring emissions is somewhat crude but, at best, provides an approximation for the purpose of reducing emissions. For instance, the EPA’s current methodology for determining fugitive emissions utilizes emission factors that overestimate actual emissions from several components of a natural gas distribution system. EPA has recently adopted more accurate emission factors for use in their GHG inventory report, but has yet to incorporate those same emission factors into Subpart W reporting calculations.

Using the same approach as detailed above, the Company determined its 2017 GHG emissions which are presented below in Table 2.

**Table 2 - Cascade’s 2017 Greenhouse Gas Emissions from its Oregon Operations**

<b>Emissions in MT</b>	<b>2017</b>
Office Facilities	285
Vehicles	242
Fugitive	7,637

<sup>1</sup> <https://www3.epa.gov/carbon-footprint-calculator/>

Emissions	
<b>TOTAL</b>	<b>8,164</b>

For the purpose of this report, the Company is using 2017 data to estimate its 2020 emissions. The changes to emissions are hard to forecast. Weather has the greatest impact on differences in emissions at the Company’s office facilities. While emissions related to fleet use are likely to increase with growth, the Company believes these increases may be offset by improved fuel efficiency in vehicles or the use of alternatively fueled vehicles. As for fugitive emissions, the Company expects a more accurate methodology for determining fugitive emissions to be adopted as an industry standard, in which case the Company’s reported fugitive emissions for 2020 may be significantly less. Overall, 2017 seems a reasonable proxy for 2020 for the purpose of this reporting requirement.

Table 3 shows the assumed emissions for 2020 and deducts the target levels for both goals to reveal the emissions that would need to be reduced to achieve the targets.

**Table 3 – Emissions Reductions (in MT)**

Goal	2020 Minus Target	Emissions Reduction
10 % below 1990	8,164 – 7,017	1,147
15% below 2005	8,164 – 6,627	1,537

Table 4 presents the cost the Company would incur to reduce its 2017 emissions to the two target levels by purchasing offsets. The Company is assuming a cost of \$15.54 per MT, which is the May 2018 Joint Auction Settlement Prices of \$14.65 as reported by California Air Resources Board<sup>2</sup> and escalated by three percent per year for a 2020 price. The Company notes that offset prices vary based on the type of project from which they are developed, and the future cost of offsets is speculative since costs may be impacted by higher demand resulting from either local or federal carbon legislation.

**Table 4 Cost to Reduce GHG Emissions**

	Cost of Offsets
<b>2020 Goal 10% below 1990</b>	\$17,824.38
<b>2020 Goal 15% below 2005</b>	\$23,884.98

This report represents the Company’s best estimations based on the information available to it as of the time of this report’s submission.

If you have any questions regarding this filing, please contact me at (509) 734-4593.

Sincerely,



Michael Parvinen  
 Director, Regulatory Affairs

<sup>2</sup> See [http://www.arb.ca.gov/cc/capandtrade/auction/results\\_summary.pdf](http://www.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf)